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THE MICRO USER

Volume 8 Number 2 April 1990 £1.50

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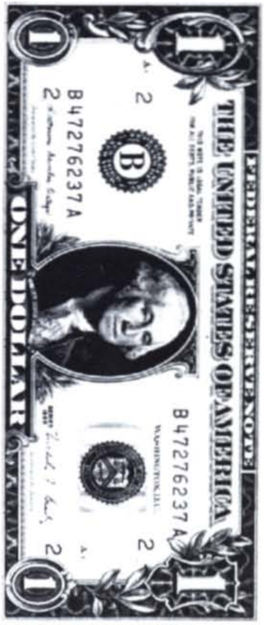

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Education Special

Is your child getting enough time at a micro to be able to cover the Information Technology requirements of the National Curriculum? Are there enough micros in schools, and are there still more mouldering in cupboards because

Play and Learn

✱ **Wormy Num Num!** **This taxing game is designed to improve both your mental arithmetic and keyboard dexterity...*Page 51***

✱ **Cheshire Cat** **The classic game of Mastermind takes on a completely different look with this fascinating puzzle....*Page 109***

Type-it-in

✱ This symbol indicates that the feature contains at least one full length listing for you to key in on your micro.

Get it right!

All the major listings in this magazine are accompanied by checksums to help you key them in correctly. For full details of how to use them see the article on page 72 of the February issue.

MICRO USER CLASSIFIEDS

The best bargains in the world of the BBC Micro come from fellow readers of The Micro User. Turn to **Page 114** to find just what you're looking for – from cheap modems to complete computer systems.

Newcomers ON TEST

Artisan 2: It has far more features than Artisan and, working in the Risc OS environment, has a specification close to Pro-Artisan...***Page 46***

Ample Toolkit: A set of utilities designed to make the popular Hybrid 5000 music system even more powerful...***Page 21***

Sound Blaster: It gives more volume and better quality to the sounds produced by the Archimedes and BBC A3000 range...***Page 73***

BookBinder: Allows you to create pages and move between them by clicking in a window – ideal for many applications...***Page 107***

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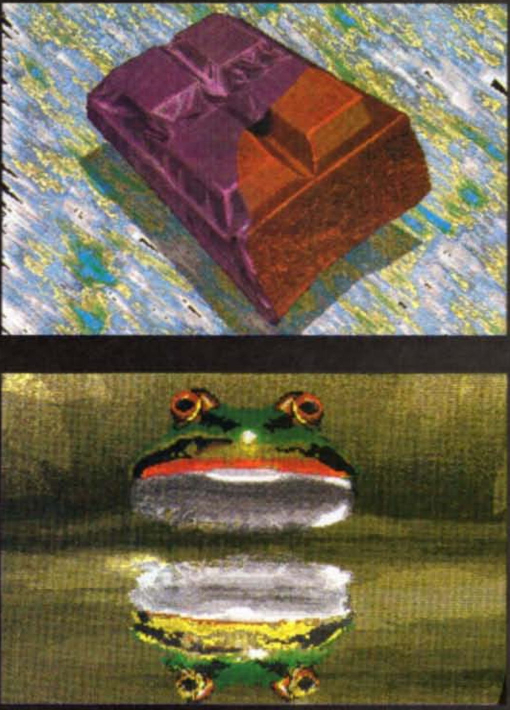
there is no teacher in the school who knows how to use it – or can spare the time? *Turn to Page 26* to discover the answers to these and other questions.

And find out what can usefully be done when, in some schools, there is only one micro between 400 pupils.

Educational software reviews start on Page 30



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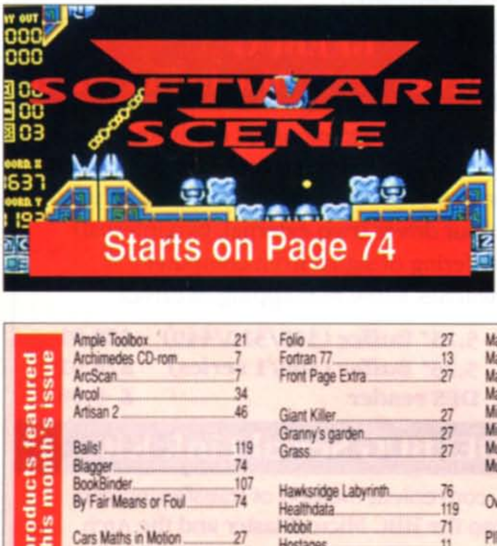

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- Hacman's index: Text file for the first year

For the Archimedes series and A3000 only:

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View from the top:

BBC games – past, present and future – are discussed with one of the country's leading software publishers

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All prices exclude VAT. Please add £3 for P&P (£7 for hard drives). Prices and products subject to change without notice.

News BEAT

Warm reception for CD-rom techniques

A JOINT project between Acorn Computers and Cambridge-based Next Technology Corporation, the innovative CD-rom drive system for Archimedes machines and the A3000, has created tremendous interest following its first public showing.

It is capable of storing 550Mb of information, equivalent to 250,000 pages of text, 5,000 photographs, 72 minutes of high quality audio or a combination of all three including animation sequences.

The CD-rom system can be used as a stand-alone or networked multi-media resource and by using a revolutionary CD production technique, Next Technology (0223 420222) can make a single compact disc for less than £300. This allows schools to generate their own resource material and to archive school records.

The drive has access times up to twice as fast as competitive systems and its CDFS software will read information from any standard discs conforming to ISO 9660 or High Sierra specifications as well as commonplace digital audio CDs.

The new CD-Rom Drive System for Acorn BBC A300 and Archimedes Computers

Latest news as *The Micro User* went to press was that the CD-rom drives were due with selected Acorn dealers from March with a complete A3000-based multi-media system on offer to schools for under £2,000. CD-roms can be added to installed A3000 and Archimedes machines at around £600 plus SCSI card. The drive comes with CDFS utility software for the Risc OS multi-tasking system, full documentation and a sample resource disc.

Graphics can be ported into other software packages such as Draw and Acorn Desktop Publisher while animation sequences can be generated to accompany audio CDs.

Another Cambridge company, Software Solutions (0954 211760), has launched a new software package called Genesis which provides powerful information retrieval and manipulation especially when used with the new CD-rom technology.

It offers exciting cross-curricular opportunities for the education market, allowing class projects to be created easily with individual pupils and groups working simultaneously on separate pages which can be linked togethers later.

Genesis will run on any Archimedes computer with 1Mb of ram and a single floppy disc drive. It is compatible with the standard and SCSI hard disc and Econet system. Price £80.44 for a single copy, £321.77 for a site licence.

Genesis – a powerful new educational software package for BBC A300 and Archimedes Computers

Podule gets a face lift

WHEN *The Micro User* featured Brainsoft's multiple input/output podule for Archimedes machines last month, reviewer Ian Whitmore said it was a good buy "assuming the software continues to improve".

Since then, the software has improved and it now allows the video digitiser to capture pictures in 24 bit colour. Latest disc-based software means that pictures can be grabbed with a resolution of 576 x 640.

"This puts it on a par with others systems which can cost £800 or £900", said Brainsoft director Richard Brain.

Existing users can leave black and white behind by sending their old rom and disc to Brainsoft for free upgrade.

New users get the upgraded software in with the package which includes video digitiser, sound sampler, double RS232 serial port, analogue joystick port and four socket rom filing system all on one expansion card for £134.

Power for young editors

CLARES Micro Supplies (0606 48511) is aiming at a May launch for its latest Archimedes product, Arc-Scan.

Using an Epson flat-bed scanner and Integrex colour printer, it makes full use of the Archimedes' power to scan, edit, enlarge and reduce images, allows them to be imported into a DTP package and will then print out at 50 100 dpi quality.

It is designed for use with Clare's new ClassMate word processor and is intended mainly for use by primary pupils.

Single user price is £39.95 with £80 for a site licence.

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We have been experts on Acorn equipment for over seven years and have built up a reputation for offering a high level of support to our customers.

As the publishers of both Beebug and RISC User magazines we are aware of the latest developments and trends.

We listen carefully to our customers and stock the items that they require. Because we have confidence in our product range we buy large quantities and therefore can pass the discounts on.

New products are thoroughly investigated before they are added to our range so you can rest assured of the quality.

Our knowledgeable and friendly staff are able to offer you unbiased advice on the best equipment to meet your requirements. Buying the wrong equipment can be a frustrating and expensive experience which we can help you to avoid.

We offer a range of credit facilities including 0% finance on all Archimedes and the Master 128.

On average over 80% of orders are dispatched within 24 hours of the order being received and if the item is out of stock you will be immediately notified.

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Beebug also offers FREE On-Site Maintenance on all Archimedes computers sold in the UK.

Call 0727 40303 and ask for a copy of our FREE information pack. This includes a copy of our new 56 page retail catalogue and details about the Beebug and RISC User Magazines. Alternatively, write to the address below.

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Spring date to meet the experts

WHEN publishers of *The Micro User*, Database Publications and Watford Electronics combined to organise the recent Mid-Winter Open Day at Watford, it was such a success that plans are already well under way for a follow-up Spring Open Day.

More than 1,300 visitors packed the company's headquarters, Jessa House, on Sunday, January 28. By popular demand the Spring Open Day has been arranged for Sunday April 29 with Database Publications again taking a leading role.

"I was extremely pleased with the success of the Mid-Winter event", said head of Watford Electronics Nazir Jessa. "The support was overwhelming and it was particularly important that information technology advisors from a number of local education authorities turned up to see our Archimedes products and range of add-ons.

"The help given by staff of *The Micro User* contributed so much to this success that we have decided to collaborate yet again and provide our customers, *The Micro User* readers and other visitors with a follow-up event".

On hand to give the public advice and help were the full editorial team of *The Micro User*, Features Editor Peter Davidson, Deputy Features Editor Steve Turnbull, Reviews Editor Pam Turnbull and Editorial Assistant Stephen Wade. They were joined by the magazine's games expert Hacman and Technical Editor Mike Cook.

As well as handing out advice, *The Micro User* team were giving away copies of the magazine and of the title's monthly cover discs.

"This successful event gave us a unique chance to meet many of our readers face to face", said Peter Davidson. "We were able to help them with their computer problems and it was invaluable in allowing us to further continue our ongoing market research into just what they want to see in *The Micro User*".

Also giving free advice were BBC Micro and Archimedes guru Gordon Taylor and the technical and sales staff of Watford Electronics who solved problems and showed visitors many bargains at post-Christmas sale prices.

Giving its official support to the show was Acorn Computers which sent along tecnical staff to advise on the whole Acorn range of computers including the BBC A3000.

The Open Day was also well supported by leading software houses in the Acorn field.

Dave Clare of Clares Micros turned up to demonstrate his popular ray-tracing art package Render Bender and flight simulator Interdictor.

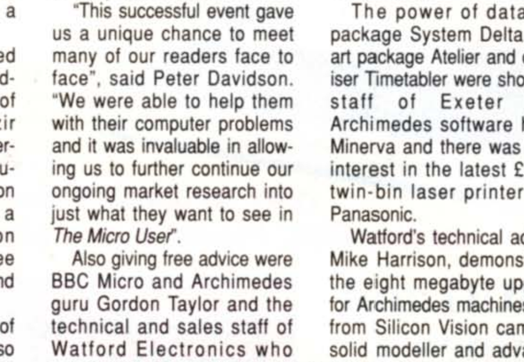
From Computer Concepts, Charles Moir showed off the sophisticated document processor and DTP package Impression for the Archimedes.

The power of database package System Delta Plus, art package Atelier and organiser Timetabler were shown by staff of Exeter base Archimedes software house Minerva and there was much interest in the latest £2,300 twin-bin laser printer from Panasonic.

Watford's technical advisor, Mike Harrison, demonstrated the eight megabyte upgrade for Archimedes machines, and from Silicon Vision came 3D solid modeller and advanced CAD packages. Features available on Micronet and Prestel were demonstrated by Micronet staff.

The next event on April 29 will follow a similar format with the Watford Electronics doors

It's a hard life for tiny folk



CUSTOMERS of Blue Ribbon (0302 321134) are shrinking – not in numbers but in size. The budget label has launched two more titles as a result of its tie-up with Superior Software, and in both, players take the roles of tiny people.

Elixir (above) features Cyril the likeable proprietor of a busy chemist shop. Tired after a hard day, he mistakenly drinks a potent liquid and shrinks to the size of an asprin bottle. To get back to normal size, he must find a bottle of magic elixir hidden on the top shelf.

In the second title, Palace of Magic, you have incurred the wrath of evil wizard Caldetti by being too kind. As a punishment, he has shrunken you to the size of a dwarf and banished you to the Palace of Doom. You must overcome magical objects and weird beings to escape.

Malcolm Bird

Acorn appoints R & D chief

ACORN Computers has appointed a new director to spearhead its research and technical development.

Malcolm Bird, 30, will be in charge of formulating Acorn's 32 bit Risc technology which is used in both the Archimedes range and the Unix workstations. Prior to joining Acorn, he spent five years with the PA Consulting Group as CAE software business director.

Managing director of Acorn, Harvey Coleman said: "Malcolm brings to Acorn strong commercial skills allied to an understanding of the role that technological strengths can play in a company's growth. We are delighted that he has joined our team".

ARM pushes Mac along

COMPUTERS Unlimited (01-200 8282) has produced an accelerator card claimed to speed up some of the already rapid graphics capabilities of the Apple Macintosh by as much as 30 times.

Before *The Micro User* readers think they have picked up the wrong magazine, the reason for this news is that the powerful Radius QuickCAD accelerator is a pat on the back for Acorn. It has been based around the company's ARM technology which is the foundation for its Risc machine with a processor running at six million instructions a second.

To achieve these excellent results this latest Radius product and its forerunner QuickColor re-coded the Apple Quickdraw graphics routine into Acorn ARM code.

In these fast moving times it is comforting to know that some things don't change

. . . and you can still get good quality programs and first class support for your

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Pretty as a pixel

MICRO buffs who think their favourite machine is a thing of beauty can now have it committed to canvas.

The Abstract Art Foundation is offering oil paintings of micros – owners send a picture of the machine and a £20 deposit. Total cost is around £60 and paintings take four weeks. Artist David Phillips can be contacted at The Abstract Art Foundation, 7 Robinson Way, Bangor, County Down, BT19 2NR.

More Doom

LAST Days of Doom is the latest offering for the BBC Micro from Trilogic (0733 244682). It joins Countdown to Doom and Return to Doom to round off the trilogy of text adventures written by Peter Killworth.

The player is the only person ever to have escaped from the planet Doom and must answer a distress call from a ship which has crashed into the planet while carrying the Ambassador of Regina.

In the Doom tradition, problems abound on the planet and finding your way is not easy. Price £19.95.

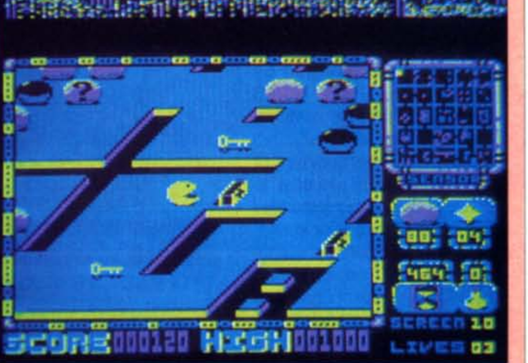
Superior in Infograms deal

AS *The Micro User* went to press, Superior Software (0625 58585) was poised to sign a licensing deal with French software house Infograms.

It will bring BBC Micro conversions of top selling Atari ST and Amiga packages Hostages and Sim City from the Lyons-based company, which is making a name for original games. Superior has plans for an Archimedes version of Hostages, but a question mark hangs over Sim City on the Archimedes.

In Hostages, the player has to storm an embassy and kill terrorists to rescue hostages. Sim City is a "pacifist Populous" calling for the creation of a city's infrastructure separating business and industry from domestic areas and keeping away pollution – a true green game.

Steve Hanson of Superior said he hopes the deal will lead to further Infograms games like Captain Blood and Tin Tin being available for conversion in the future.



Perplexity

"These original titles make a welcome change from the shoot-'em-ups and car racing games which seem to be prevalent in the UK at the moment", he added.

Superior is also to continue along the compilations trail throughout 1990 with Play It Again Sam 13, 14 and 15.

Lead game on the imminent Sam 13 will be Barbarian II, and it will also include either Pandemonium or Network, the Peter Scott arcade adventures for which Superior recently acquired rights. The unused title will go into Sam 14, which will appear mid-year, with Sam 15 out just before Christmas.

With 16 increasingly difficult levels, Perplexity is Superior's new single release.

A strategy game with 3D backgrounds, it's a new slant on the Repton theme and from initial reactions is proving very popular.

All Superior packages cost £9.95 for BBC Micro cassette, £11.95 on disc, £14.95 for Master Compact disc.

Awards for education programs

THIS year's Educational Technology Awards were presented at the BETT Show by Alan Howarth MP, Under Secretary of State for Education.

They were judged by a panel of teachers and advisers to offer the greatest potential impact in the classroom environment. In the primary sector, the gold award went to Sherston Software for The Teddy Bear's Picnic, an infants' package featuring language and maths activities.

Sherston also picked up the bronze award in this section for its educational adventure package, The Microbugs.

Silver went to NCET, the National Council for Educational Technology for its Touch Explorer Plus, a framework program for Concept Keyboards, which also won the bronze award in the secondary education section.

The gold and silver awards in the secondary education category went to products designed espcially for the A3000 and Archimedes computers. Spacetech took first prize for its Weather Satellite package to receive real satellite pictures and Clares Micro Supplies took the silver award for popular art package Pro-Artisan.

BRITISH
BETT
'90
TRAINING
TECHNOLOGY

Author of Sherston's package The Micro Bugs, Jean Norgate receives fhe gold award from Alan Howarth

BRITISH
BETT
'90
EDUCATION
AND TRAIN

Owner of Spacetech Lucy Hornby receiving her gold award

Spreading the net wider

THE fifth annual networking conference organised by Acorn Computers (0223 245200) will be held from July 9 to 11 at Keele University.

Following the success of Econet '89 and in response to demand, Acorn has expanded the conference to take in non-schools applications as well as addressing broader-based solutions for curriculum and administration in schools.

On the technical side, time will be set aside to consider Ethernet systems and wide area networks.

Hi-tech look for *The Micro User*

The Micro User will feature more colour, more screen shots and brighter page design in coming months thanks to the new technology installed by publishers Database Publications.

Through a recent alliance between itself and Gollner Publishing, Database has brought in revolutionary colour printing techniques pioneered by Hugh Gollner.

The Micro User will now be able to take full advantage of the technology now being installed at the company's Cheshire headquarters.

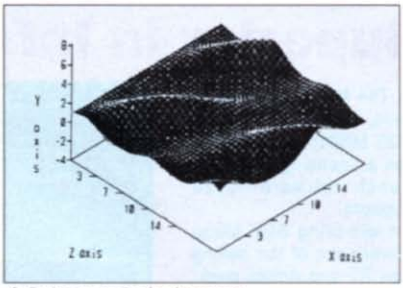
"We have long admired Gollner's highly innovative and technologically advanced approach to magazine production", said chairman of Database Publications, Derek Meakin.

"A welcome spin-off from our new arrangement is that *The Micro User* and other Database titles will benefit considerably from the introduction of that technology".

New prices

The prices listed in the review of Snapshot and Leisure Complex in the March issue were incorrect.

The products cost £15 each and are supplied by Scetlander (041-357 1659)



A display created using Interacter

Fortran for presentations

INTERACTIVE Software Services (0785 715588) has launched Interacter, a portable Fortran 77 user interface development system for the full range of Acorn equipment.

The sub-routine library provides a wide range of text and graphic user-interface "building blocks" for scientific and engineering users. Interacter programs will run on the R140, Archimedes and 512 co-processor. Advantages are that Interacter is easy to use and also portable between Dos Plus, Risc OS and Risc iX. It has more than 250 text and graphics screen handling routines for easy production on screen of bar charts, line plots and many other vehicles for presentation graphics.

Prices start from £99, with royalty-free versions starting at £149.

Showcase for the Euro trade

THE European Computer Trade Show to be held at London's Business Design Centre from April 1 to 3 will provide a trade-only stage for European, UK and American companies to show the latest releases which end users will be able to buy in coming months.

Exhibitors will include developers and sellers in the BBC Micro and Archimedes markets and the show will give users pointers on the best purchases with the finals of the European Computer Leisure Awards for which judging has taken place in the UK, Spain, Italy, France, Germany, Sweden and America.

More music for children

HYBRID Technology (0223 420360) has launched Music 5000 Synthesiser Universal, a £99 unit which adds high quality stereo sound to its whole range of standard BBC Micro music programs, including the widely used Compose and Recorder Tutor.

Also new from Hybrid is the first in a family of music programs for use by very young children and those with special needs. Called Soundscape, it uses colour to help children compose simple music.

Costing £29, it also lets youngsters combine and perform sounds in both traditional and abstract styles.

For older children, the £99 Music 3000 Expander doubles the system's number of sound channels to 32 and the new Ample Toolbox software package at £34 allows the creation of text and graphics to accompany music.

Coinciding with the Hybrid launch is Microvitec's Touchtech 501 touchscreen which links with the Music 5000 system to make a versatile instrument aimed at children with special needs.

Through finger position and hand shape, they can control hundreds of different sounds and move them around the stereo field.

Called Soundspace, it is available separately at £29 for existing Music 5000 owners or can be bought along with the Music 5000 at a special package price of £128.

Language no longer a barrier

AS business links within the European Community increase, correct translation becomes a greater problem especially when technical terms come into play.

Subscribers to electronic communications service MicroLink (0527 28515) can now get over many of these hurdles thanks to a new service which has gone on-line

A second gateway into the Luxembourg-based ECHO databases has been opened giving access into Eurodicautom, the on-line European dictionary.

It provides accurate translations between EEC languages and once users have specified their source language they can receive the foreign equivalents for up to seven other countries at a time. The service translates not only on a one-to-one basis but also gives options to fit the right context in which the word or term is used.

There are no surcharges for subscribers using this service which covers English, German, Danish, French, Italian, Dutch, Portuguese and Spanish.

When used with ECHO I, the European on-line "yellow pages" index to foreign databases, this new service is yet another step towards the common community of 1992.

Premier 3 for the Arc

CIRCLE Software (0793 770021) has released Premier 3. It combines various elements of word processor, spreadsheet and database and costs £138.

It is basically a word processor environment which is totally command driven with its own language incorporating windows and the ability to create macros.

It can both read and write database files. Embedded in the editing function is the ability to include simple spreadsheets. Premier 3 has been compared to Colton Software's Pipedream 3 but was conceived and developed specifically for the Archimedes.

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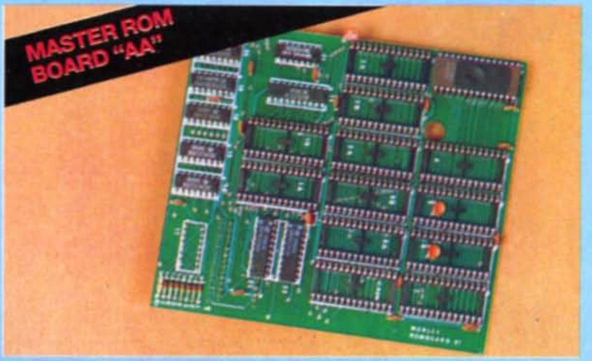
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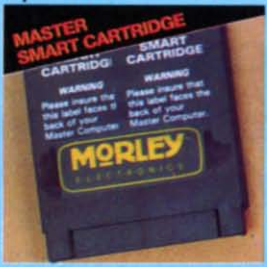
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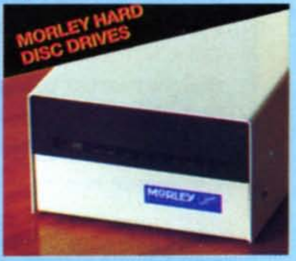
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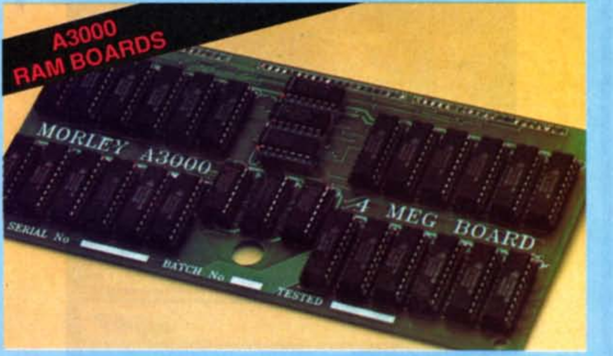

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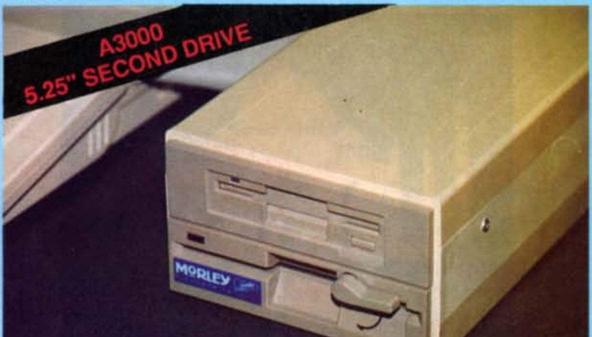

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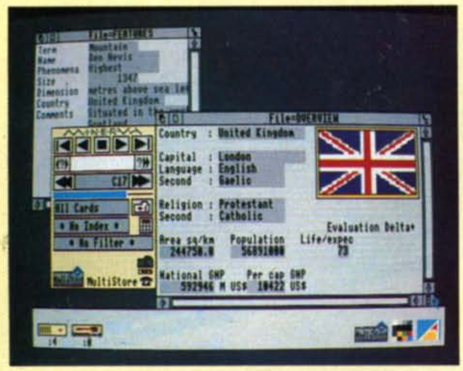
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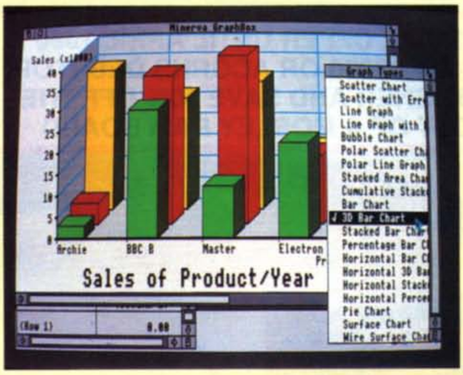
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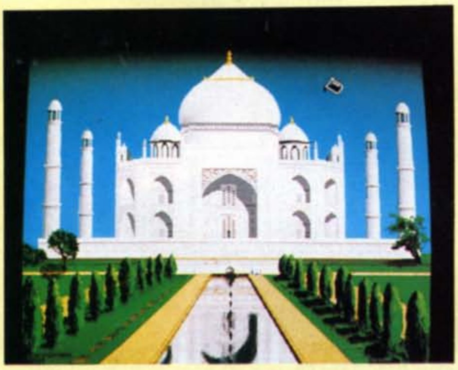

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Sixth form software

SIXTH formers from Danum School, Doncaster have gone into the software business by forming themselves into a Young Enterprise company called EagleSoft.

Their chosen business is to write software for the Archimedes range and their first offering is Maths Disc One.

The mathematical software designed and written by the pupils includes six programs on 5.25in or 3.5in discs in both DFS and ADFS formats accompanied by text files. There are separate menus for 8 bit and 32 bit machines, and one program is designed to take advantage of the Archimedes Wimp system.

"Every program except Amazing Maths will run on all types of Acorn machine from the BBC B onwards, as far as we are aware", said managing director of EagleSoft Stuart Herbert.

"Due to the limited capability of the standard model B, some programs are forced to make certain graphics alterations to compensate. All programs can be accessed by simply booting the disc, so helping even the most inexperienced user".

The disc costs £20 but individual maths programs on it are available for £5 each from EagleSoft at 47 Wolsey Avenue, Doncaster, Yorkshire, DN2 6ET.

Data updated

A NEW data handling package has been pioneered by Anglia Television (0603 615151). Key Plus has been developed for ITV Schools as an advanced version of the successful Key system which forms the basis of a cross-curriculum information system in more than 15,000 schools throughout the country.

Key has become a standard data system for BBC Micros and Key Plus developed by GSN Software is destined to set the equivalent standard for Archimedes machines. It can be used across the whole curriculum, is suitable for both primary and secondary levels and can be operated in a variety of languages.

Originally developed for use in conjunction with ITV schools programs, the databases on Key and Key Plus now stand alone. Its wide range of data files supply facts for pupils but also allow them to input their own data. Subjects include birds, mammals, fish, science topics such as rocks and minerals and history.

Graphics and maps can be handled in full colour by the new package which has a wide range of graph and statistical facilities. It provides all routines necessary to create and amend files running under mouse control and windowing with interactive video disc control as standard.

"Key Plus retains all the characteristics of Key while making available many more sophisticated facilities", said Anglia Television education officer Peter Stibbons. "It is designed specifically for classroom use and includes facilities to access existing Key datafiles. Schools which have purchased a range of files or developed many of their own will find their investment safeguarded".

Key Plus should be available by Easter at a single user price of £50. A primary school site licence for up to 150 pupils costs £60 and a secondary school site licence for 800 pupils upwards costs £150.

Due out for the Archimedes range in September is a powerful knowledge-handling system called Key Author. Designed to be the core of multi-media operations in the classroom, this will be followed in 1991 by Key Calc, a spreadsheet which integrates with Key Plus.

"Key Plus, together with Key Author and Key Calc represent a major investment by Anglia Television in the developing multimedia requirements of education", added Peter Stibbons.

Pupils run through the new Key Plus program

Picking the winners

CRICKET selection can often be a thorn in the side of teachers and a cause for complaint from pupils. Thanks to Marlis Software (0752 709357), BBC Micros can now help with the decision on who makes the school team.

Marlis Cricket Database is a program specially written to help with the management of cricket in schools and colleges. Although it has been produced with schools in mind, the disc-based program allows any cricketer to keep a record of previous performance in matches played.

Menu-driven and user-friendly, it is designed with children or non-computer users in mind. The players can enter their own details of matches played, batting and bowling averages and availability complete with password protection. Team managers can also put in information then use the data to run teams.

In the recording part of the program, there is the facility to input a finished cricket scorecard kept at the time the game was played. Once input, these scorecards can be viewed and printed at any time.

An added spin-off is that a pupil's interest in cricket can be used to generate an interest in micros.

Marlis Cricket Database costs £35 and can be obtained from Marlis Software at 40 Jean Crescent, Higher Compton, Plymouth, Devon. Ring either 0752 709357 or 0752 896077.

CD-rom competition

ACORN Computers (0223 245200) and Next Technology Corporation are offering schools the chance to win one of the first Archimedes-based multimedia systems worth £2,000.

The competition is open to primary and secondary schools or individual classes. Entrants must submit an innovative idea for a CD-rom application in not more than 500 words or four A4 pages which may include illustrations. The project should be based on one or more of the national curriculum subject areas and aim to provide a

➤

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useful long-term resource for the school.

The winning school will be asked to submit its project material in the form of data, text and graphics on floppy disc using any standard format. Next Technology will process all the material and generate the school's own CD-rom application disc – a second part of the prize.

Entries should be submitted to Katherine Pierpoint, Acorn Computers, Fulbourn Road, Cherry Hinton, Cambridge, CB1 4JN by April 27.

Make a montage

SNIPPET and Poster are the two latest products from educational software house 4Mation (0271 45566). Snippet for the Archimedes is a module which is loaded from the DeskTop then lies dormant until certain keys are pressed. It allows pupils to capture screens from their programs, change the scale, create montages then print out the result.

Also for the Archimedes, Poster is a collection of fancy fonts and borders. Designed to allow pupils to create interesting posters, is comes complete with a set of 15 new outline fonts and a selection of clip-art. It is compatible with other Risc OS software such as Draw and various DTP packages and gives the ability to print out giant posters.

Both programs are due out in May with prices yet to be fixed.

War on the cowboys

SCHOOLS have been warned to look out for "cowboy" computer suppliers as head teachers and governors take over more purchasing responsibility. The British Educational Equipment Association has launched a new code of practice for its members with the backing of the Department of Education and Science.

Director of the BEEA, which represents 156 manufacturing and distribution companies, Dominic Savage said: "The freedom of purchase will encourage many unethical companies and many more unscrupulous salesman to desire a fast buck out of the education market.

"There will be pressure to purchase products which may well be appropriate in other environments but which do not meet educational standards".

Michael Page of Acorn Computers told guests at the DES launch in London: "To a naive governor, the deal may look very good but it could end up costing the school several thousands of pounds, perhaps 50 per cent or more of their available funds".

The new code of practice embodies seven points to which BEEA members must adhere. These include educational safety, compliance with British safety regulations, fair and proper descriptions in catalogues and adverts, care and skill in advisory or consultant services, and presentation of BEEA membership cards on any visit.

The BEEA are on 01-537 4997.

Robot teacher

PIP is one of the latest in the line of programmable robots which helps children from four to 12 to grasp the basic principles of maths and using a micro.

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Full price of Pip is £244.25 but there is a cash discount price of £190.61. Postage and packing is £5.75. Designed and manufactured by Swallow Systems, Pip is available from Fernleaf Education Software, Fernleaf House, 31 Old Road West, Gravesend, Kent, DA11 0LH. Tel, 0474 359037. It can be rented by schools for £9.20 plus carriage a week.

The truth about TELEX

PRICE CUT! Telex charges on MicroLink are now 20% cheaper than on Telecom Gold

How much does it cost to go on Telex?

You could go the conventional way and buy a dedicated Telex machine. The cheapest will cost you £1,604 (the Whisper), the dearest £2,892 (the Cheetah). You will also need a separate telephone line, costing £101 to install, plus £404 a year rental. That's a total outlay over the first year of a minimum of £2,109. (All prices include VAT.)

Or you could do what more and more BBC Micro users are doing – use your BBC Micro to double as a Telex machine. And just use your ordinary telephone!

How do I turn my BBC Micro into a Telex machine?

All you need is a modem and appropriate communications software (see the advertisements in this issue), a telephone, and a subscription to *MicroLink*.

Telex is just one of a growing number of services available to micro users on *MicroLink*. You can also read the news as it happens, go teleshopping, create your own closed user group, send telemessages and electronic mail right round the world, download free programs directly into your micro . . . and much more.

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Because it's a standard means of instant communication between businesses. Today there are 150,000 Telex machines in use in Britain – and more than 2 million worldwide. It's used to dramatically speed up business communications – it's just as quick as using the phone but far more efficient, because you have a hard copy of every "conversation" for your records.

But there's a big bonus you get when you use *MicroLink* for Telex that the conventional way doesn't offer.

With *MicroLink* you don't HAVE to be in your office to send or receive Telex messages. You can just as easily use your computer at home (or even a portable). So now you can check whether there are any Telex messages waiting for you – anywhere, anytime. How's that for your business efficiency?

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- **Archive Bulletin Board** keeps you in touch, on a day-to-day basis, with what is happening in the world of Archimedes. (01–683–0629, scrolling, 8n1, up to 2400)
- **Archive Shareware / Careware discs.** We have a range of 25 discs of public domain software from various sources. Many of the discs contain several quite substantial programs for as little as £3.50 per disc.
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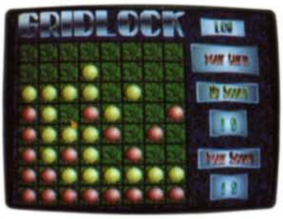

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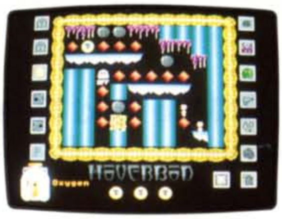
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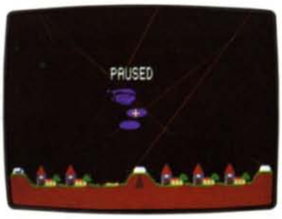

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Spanner for the works

Product: Ample Toolbox
Price: £34.00
Supplier: Hybrid Technology Ltd., 273 The Science Park, Cambridge, CB4 4WE.
Tel: 0223 420360.

When a software producer listens to what the users have to say you can be sure you're on to something good.

Ian Waugh tunes in

THE Hybrid Music System has thousands of dedicated users and is still far and away the most popular of its kind in education. With such a large user base, an inevitable list of wishes and wants has found its way to Hybrid Technology.

Many can be solved with an Ample word or two, but others require facilities not available on the basic system.

Hybrid has now released the Ample Toolbox which contains a collection of extensions to the Ample Nucleus and Studio 5000 software and includes many facilities on the users' wish lists.

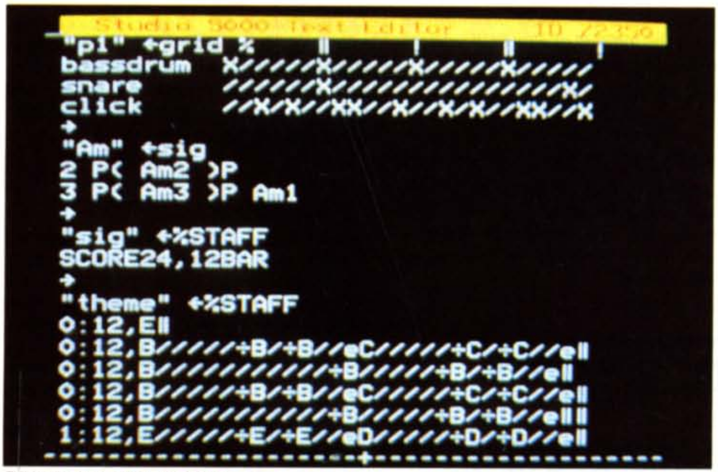
The Toolbox is supplied on an Issue disc which creates a system disc when booted. It automatically determines if you are using single or dual drives and whether they are 40 or 80 track. All you have to do is insert a blank, formatted disc.

Your new System disc contains three extra Ample modules plus two programs. We'll look at the modules first – TEDIT, IEDIT and UTILS.

In order to make the most of your system it's worth knowing how the Ample environment handles modules. The front end of the Music 5000 – the Studio 5000 – is fairly transparent in use. To enter a module such as Notepad or the Stave Editor you simply select it from the main menu.

Ample then removes the current module from memory and loads the new one from disc, a process you are not really aware of other than by hearing the disc drive whirr.

The new modules do not appear on the main menu but can be loaded in a similar way from a *jukebox* program by pressing f9. This maintains the system's transparency, although loading the jukebox removes the program currently in memory.



```
"p1" ←grid %       ‖     |     ‖     |
bassdrum  X/////X/////X/////X/////
snare     //////X///////////////X/
click     //X/X//XX//X//X/X//XX//X
→
"Am" ←sig
2 P( Am2 )P
3 P( Am3 )P Am1
→
"sig" ←%STAFF
SCORE24,12BAR
→
"theme" ←%STAFF
0:12,E‖
0:12,B/////+B/+B//eC/////+C/+C//e‖
0:12,B/////////////+B/////+B/+B//e‖
0:12,B/////+B/+B//eC/////+C/+C//e‖
0:12,B/////////////+B/////+B/+B//e‖‖
1:12,E/////+E/+E//eD/////+D/+D//e‖
-------------------+------------------
```

Editing multiple words in TEDIT

Modules can also be loaded and removed from the Ample environment manually with MLOAD and MDELETE commands. MLOAD does not remove the existing module from memory, nor does it clear the current program so this is by far the most versatile method.

The manual explains the process very clearly and includes several examples.

One of the benefits of using MLOAD is the ability to have more than one module in memory at the same time (memory permitting) making it a simple matter to switch from one editor to another.

Now let's take a closer look at the new modules.

TEDIT

This is a full-screen text editor which offers several advantages over Notepad. In operation it's very like a word processor and, unlike Notepad, you can scroll up and down, left and right through the text.

It will operate in any mode – Modes 3 and 0 are particularly useful – and lines can be longer than the screen width. It remembers the mode and re-enters it when called again – although not if another editor has since been entered.

I have defined one of the function keys to enter TEDIT and change the screen colour to the popular white text on blue background:

```
*KEY7 3MODE TEDIT 19#OUT0
#OUT4#OUT0#OUT0#OUT0#OUT|M
```

As with most Studio 5000 editors, TEDIT has both command and edit modes. Pressing Tab swaps between them. When you enter lines in command mode the editor scrolls up the screen so you aren't restricted to just four lines as in Notepad. Bring back the editor and its contents by pressing Tab.

Shift, Control and the cursor keys are used to move around the edit screen. Text is entered in insert mode – Notepad uses overwrite – and there are copy and line delete operations.

Single words can be defined in TEDIT exactly as they are in Notepad and named and made in the same way, too. However, NAME inserts the word name and the [and] brackets into the editor around the text – Notepad doesn't show these in the edit area.

But TEDIT can hold several words at the same time – which is why [and] are required – so you can edit more than one word at once. Words can be easily split or joined together and new words can be added to the text area.

Typing MAKE executes the contents of the editor just as if it had been typed in. It makes word definitions and also carries

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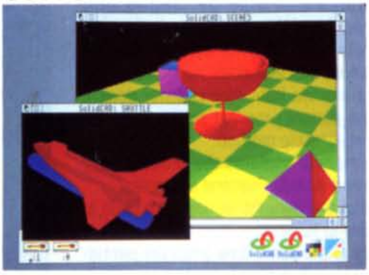

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"very useful indeed for development work...produced significantly more efficient code" - Micro User July 1989.

"RiscBASIC wins the race...has the edge overall...more likely to provide the correct results" - BBC Acorn User Nov 1989.

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- Micronet August 1989.

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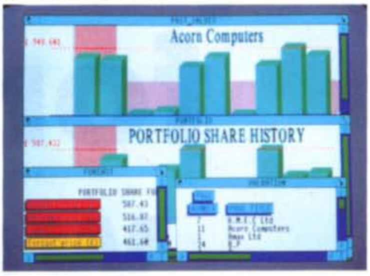

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out any open instructions. This allows you to execute a test sequence for a word by using the word name after the definition, for example:

```
"note" [ @ 0:C ]
"randnotes" [ 8FOR( 7 RANDL note )FOR ]
SCORE 12, randnotes
```

It can also be used to try out new instrument definitions on a sequence of notes.

IEDIT

The manual calls IEDIT an image editor and it is arguably the most sophisticated and complex member of the Toolbox. It lets you design and edit Mode 7 screens using text, graphics and effects and store them as Ample words.

If you have used a Mode 7 screen designer – of which there are several on the market – operation will seem familiar although IEDIT has a few especially interesting features.

The first thing you'll notice is that the edit area occupies the *whole* of the screen. Movement is with the cursor keys and the same function keys which are used in Notepad to insert/delete lines and characters are used here. You can also insert and delete columns.

Teletext control codes are entered with the function keys. These toggle between on/off codes such as flashing/steady, double/normal height, separate/contiguous graphics and so on. They also cycle through the text and graphics colours, which means you don't have lots of keys to remember, you just tap a key to cycle through the colours until you hit the one you want.

The QWASZX keys are used to enter graphic pixels. You can start with a solid block by pressing f5.

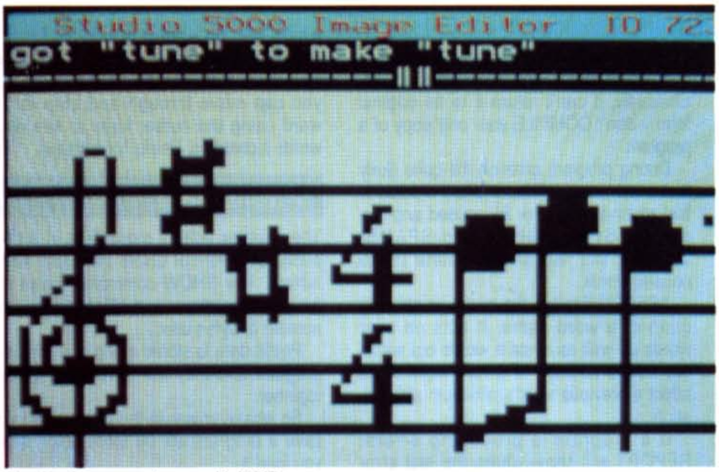
Although there is no information line as such, the cursor shows if you are on a text or graphics character – it becomes an underline – or a control code – a block. There is also a pop-up help menu to remind you of the function and cursor key definitions and to describe the character at the cursor position.

There are several edit functions. For example, you can take a character and *paint* it around the screen by holding Shift and using the cursor keys. You can copy a rectangular area of the screen to another place and there is an image buffer which can hold a separate image.

You can specify just a part of an image to be made into a word. To save memory, images are only stored down to the last blank line.

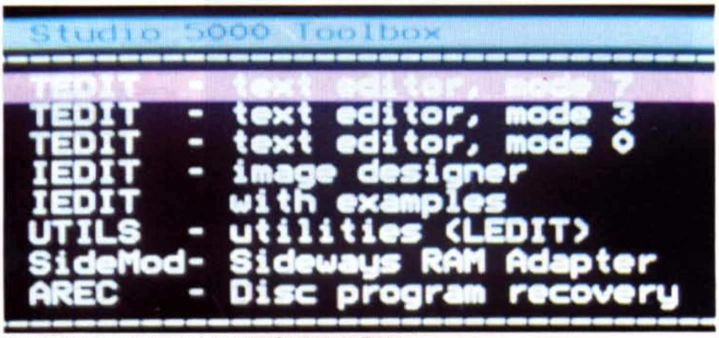
There is also a windowing facility which lets you determine exactly where on the screen the image will appear when it is displayed from within a program.

New images can be added to the edit area much as new words can be added to TEDIT. The disc contains several excellent demo screens. The manual explains how to synchronise images to music and includes several tips on using images in your programs.



```
Studio 5000 Image Editor  ID 72
got "tune" to make "tune"
```

Drawing the screens is easy with IEDIT



```
Studio 5000 Toolbox
TEDIT   - text editor, mode 7
TEDIT   - text editor, mode 3
TEDIT   - text editor, mode 0
IEDIT   - image designer
IEDIT     with examples
UTILS   - utilities (LEDIT)
SideMod- Sideways RAM Adapter
AREC    - Disc program recovery
```

The exciting range of options from the Studio 5000 Toolbox

One of the most interesting features of IEDIT is the way it stores the images. Actually there are two methods: One is the traditional way which stores codes as text using #OUT and the other stores the codes themselves, so when you list a word it looks like lines from the screen. This is called Display format, and is much more compact.

You can GET Display words into Notepad which is particularly interesting because you can't enter teletext codes directly into Notepad. This allows you to create colourful control panels and other screens. Nice.

UTILS

The UTILS module contains a line editor called LEDIT and adds eight extra program words to the system:

LEDIT provides a direct command-driven method of editing any type of text word. Each line in the word is given a line number – this'll bring back memories to Music 500 users – and you can edit more than one word at the same time.

It has several more sophisticated uses, such as the creation of text files – for execution using *EXEC – and batch files. It also allows program-controlled editing which lets your program define new words, define and execute words that define new words or completely redefine itself. One for the programmers, perhaps, but extremely powerful, nevertheless.

Among the additional commands are several which have been heavily requested for a long time. This includes MERGE which actually appeared in an early manual by mistake – just shows what Hybrid Technology's own system can do.

Apart from allowing you to create programs in sections, it's ideal for loading oft-used routines and instrument definitions – far faster and more convenient that *SPOOL. It prompts if there is a name clash so you can rename the word.

COMPILE is a space saver. It reduces a program to the smallest size possible by removing spaces, line ends and comments and renaming all user words to *z*.

Ample keeps track of each word as it is created so even if they all have the same name, the program can differentiate between them. Try it.

COMPILE may save one or two k of memory although the resulting program will not be very readable.

A special word called NOCOMPNAMES can be used to store the names of words you don't want compiled. in addition, COMPILE doesn't affect words starting with an upper case letter – such as RUN. DIS-

➤

COMPILE expands a compiled program to make it readable and editable although, obviously, it can't return it to its original form – don't COMPILE your only copy of a program.

During program creation it's quite likely that a few words will have been created to test routines and now lie unused and forgotten. SPARESHOW and SPAREDELETE will reveal and delete these unused words.

ABBREV displays the minimum abbreviation of a word name. It acts on user words as well as system words but watch out as the addition of a new word could affect a previous word's minimum abbreviation.

If a program is producing errors, REPORT will show where the last error occurred along with the the line number which can be edited in LEDIT. Finally, BROWSE presents a display of the structure of the program. It lists the words and you can move through and step *into* a word using the cursor keys to see what words it contains. Useful for analysis.

Public data

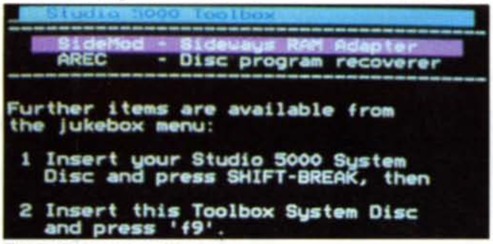
The Toolbox editors store data in Ample public data format unlike the Main Menu editors. The SHOW command shows the type of data present and MEM tells you the number of bytes used.

Public data is stored along with the user program and they are saved and loaded together.

So whatever was in the editor when you save a program will be there again when you load it.

SIDEMOD is a godsend. It adapts your system disc to store a selection of modules in Master sideways ram. No more disc accesses when you change editor. Lots more disc space for files – a boon if you only have one drive and use DFS. Brilliant.

Oddly, there is only a small increase in speed when loading modules from ram. The delay is apparently due to housekeeping tasks, not to the file storage system – I have already adapted my system to store the main menu editors plus the new Toolbox modules in sideways ram.



```
   Studio 5000 Toolbox
-------------------------------------
   SideMod  - Sideways RAM Adapter
   AREC     - Disc program recoverer
-------------------------------------

Further items are available from
the jukebox menu:

 1 Insert your Studio 5000 System
   Disc and press SHIFT-BREAK, then

 2 Insert this Toolbox System Disc
   and press 'f9'.
```

The Toolbox is very easy to use

AREC is an Ample program recovery utility. It scans a disc – DFS or ADFS – for the start and end points of an Ample program which it saves to another disc. It will recover programs deleted from the catalogue – but, obviously, still on disc – although it won't be able to recover a corrupt one.

The features and utilities in the Ample Toolbox have been carefully designed and thought out. The manual follows Hybrid's usual format – and even includes an index.

Altogether a super package.

Summing up

Ample Toolbox provides an excellent set of tools and utilities for the Hybrid Music System user. They integrate perfectly into the system and you don't have to be an expert Ample programmer to use them or indeed benefit from them.

It's certainly a worthwhile addition to any Hybrid Music System and an essential purchase for the Ample programmer or musician.

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410/1 Colour	£1166
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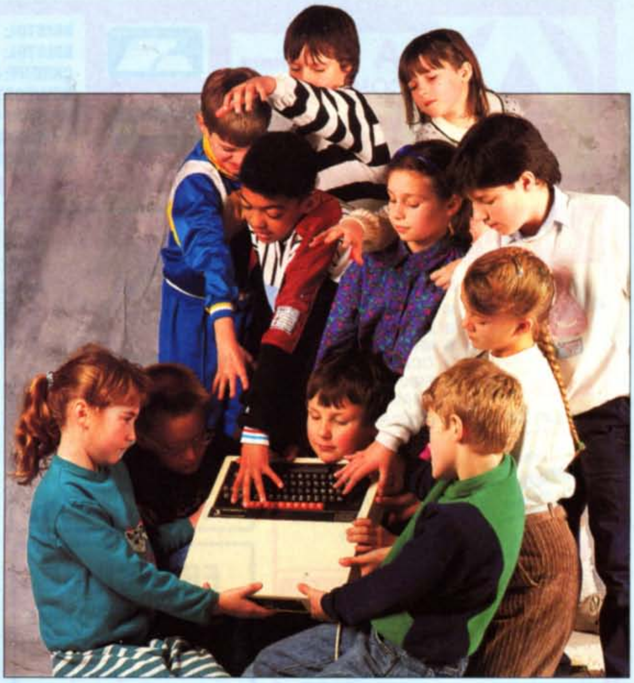

400 children and IT...

PROBABLY the last time anyone had the nerve – it must have been a politician – to suggest the ratio of micros to children in primary schools it was about 1:120.

Taking that to be a fact a deeper and more worrying truth emerges: Most of us are aware that there are IT-mad schools and maybe they have their ratio down to 1:60 or even one per class.

So it follows that there are at least a few – and probably many – schools with ratios of around 1:400. Unfortunately those tend to be the ones where the IT equipment is left securely in a cupboard.

That's perhaps not so surprising when you think about it. Just how does a teacher cope with having one micro between 12 classes, and what can be done that is worthwhile and meaningful for the children in their charge?

If you can answer that question you are going to provide some useful guidelines for schools only averagely blessed in the silicon department. So, to that end, here's some thoughts for teachers.

Just for the moment, leave the machine in the cupboard and let's talk strategically. You need to define your attitude to the use of the machine in school, leaving aside the National Curriculum for the time being. Ask these questions:

- Do you want ALL children to have an equal opportunity to use the machine – is it IT for all, or nothing at all?
- Do you want to narrow down the use of the machine to an identifiable target group?
- If you want to narrow down will you do so by age or ability or need or some other criteria?
- If you narrow down by age will you go for the top or the bottom of the school?
- If you narrow by ability will you go for the brightest or least able?
- If you narrow by need will you go for remediation or extension?

Having decided all that, you must then ask yourself whether you want to use the machine to support the present curriculum or to introduce a new IT element into it.

There is no correct answer to these questions, whoever in your school has to take the decision is going to come in for a storm of protest from interested parties. The egalitarian will be attacked by the special needs teacher all the way down the line and any school that puts its IT effort into, say, helping those new entrants with reading problems will have to fend off demands from parents who perceive their children to be bright and neglected.

Don't let it worry you, from the school's point of view you must do what is best for the children, that will be different everywhere but you will have two stock arguments to hurl into the fray.

First, if the machine's been sitting in the cupboard all this time and no one has used it then that's their problem, if they don't like what you're doing let them come up with a better idea.

Second, if any parent wants to know why their little Johnny/Johanna isn't getting time to study the nuclear physics they are so obviously capable of on the micro you can direct them to their local MP or councillor to come up with the readies.

It is of them they should inquire just why the government/LEA hasn't provided the funding for IT in schools so obviously needed if we're going to lead the world in toaster manufacture by the turn of the millennium. Let's deal with the main options one at a time, though ideas will cross over from one to another.

The egalitarian school has to consider overall availability. In terms of time spent on the micro there is a raw figure of 2.5 hours per school year if you have 1:400.

But things will not work out that badly. There are ways to use the micro that can involve large groups of children at once, though these will be supporting the present curriculum rather than introducing new skills that are IT-based.

Newsroom simulations like Shropshire's **Extra**, Sherston's **Teletype** or the Derbyshire series including **Hijack** – only available easily in Derbyshire unfortunately – will all give a class a day's news processing. Making up a newspaper can be done quite easily by hand with one of these packages providing the raw news is available.

The children will still be using a wide range of language skills, both spoken and written, with the further advantage that all these programs allow you to create your own news story to fit in with what ever topic you are covering at the time. Get a few old typewriters in and you'll really have something going.

Hitch your machine up to a school-sized television and you have a visual aid for the whole class. It's uses may seem a little narrow at first but try **Story Starts** (Sherston), **Granny's Garden** (4mation) or **The Princess and the Ring** (Cambridgeshire Software House). These are all short adventures with a high pictorial content that can be used to start creative work of all sorts.

Don't worry if you don't get to the end of the adventures, you'll find that some of the class will drift off quite quickly, but it will put the machine in the classroom and it becomes familiar – less special and more part of the furniture.

Some simulations lend themselves to short bursts of activity on the micro with loads of tasks to be done away from it. **Cars – Maths in Motion** (C.S.H.) is a goody here – the class can spend weeks designing their cars, plenty of maths, art, craft and so on. They can use occasional micro time to test run the settings they have worked out and, at the end, with your big screen again, you can race the cars against each other as a class activity.

Content-free software

At the more extreme ends of the software spectrum you have drill and practice verses content-free packages. Many drill and practice packages are available – HS Software specialises in this sort of thing while C.S.H., ESM and Sherston have a fair amount in their catalogues.

Using this kind of program to back up basic number and literacy skills has a lot to commend it in a 1:400 school where the main aim is to see that each child has some access over the year. It tends to be easy to use and any teacher or parent will see its value.

Most of the programs are short, so you could get a whole class through in a few days with something like **Maths in Space** from C.S.H. or **Tens and Units** from Sherston. They would all have had a go and all rehearsed a skill.

This is good entry level stuff, but don't dwell on it: As soon as everyone feels comfortable with the equipment look to move on, because drill and practice is not exploiting the machine to anything like its potential.

Content-free software is much harder to use with 1:400. But still, a package like **Folio** (ESM) will allow children to enter the poems they have written and see them printed out in a wonderful cursive script. At the same time they will have explored, in however limited a way, some of the potential of a word processor.

> ‘If you're not using micros yet, start now on your own terms, before someone makes you do it on theirs’

Another way to use a word processing package is to have a whole class story. The children use the machine in twos and the first pair start any story and get half an hour, say, to write as much as they can. Then the next pair come along, read what has been written and pick up the story from there.

At the end of each day the story so far might be printed out and read to the class, and the next day continued. A whole class would get through this activity in two days and most word processors are so straightforward that they would need the minimum pre-knowledge. **Pendown** (Logotron) is a good all-round word processor for the junior school and is ideal for this.

If you have a project running in which you are going to collect a large amount of data – a traffic survey or dragging the school pond – each child or group can add their data to a class database.

Once all data is gathered in the big screen can be used to discuss things like the average shoe sizes, colour of cars, number of crisp packets dredged. Look out for **Grass** (Newman College) and **Data Press** (Sherston) for database work.

The organisation of these activities within a school is very important. First and foremost are the physical factors – you must be able to move the machine around easily from class to class and to a place of safety at night. You need a trolly – not one of those melamine and tubing jobs but something of industrial strength, welded together, with big wheels.

The trolly needs to be big enough to take the whole system with room for monitor and printer – whether you've got one yet or not – on the top and a lower shelf for the keyboard.

The addition of wooden lips and gallons of Blu-Tack will prevent things falling off during transit.

Make sure that all the power leads plug into one plug-board, preferably attached to the trolly, so that there is only one mains plug to go in the wall. All other equipment should stay plugged together at all times.

You may find that this setup abhors stairs; if so you will have to timetable it to ascend/descend once a month, especially if disassembly is required.

When it comes to the day-to-day timetabling of the machine the bigger the block of time the better. It is very difficult for children – and teachers – to maintain interest in something over a long period, the original purpose is lost and the micro-based task becomes an end in itself rather than part of something going on everywhere.

When a class has use of the machine it should make use of it, and you have to be a little ruthless here: No matter how important you think a particular lesson is, those that need to use the micro should do it, otherwise you will end up with a lot of dead time and again the task will drag beyond its useful length.

Timetable well in advance and try to use dead time like school trips or the Christmas production by handing the machine on to a class that can use it.

Implicit in this setup is some form of integrated day because, while you can run a formal class with the machine at the back and the screen out of sight of the rest of the class, they need the freedom to discuss and have access to the teacher.

You may alternatively site the machine in a shared area just beyond the confines of the class.

Remediation

If you're going to use the equipment for remediation or low-ability pupils, you are definitely going to be looking at curriculum support. Again you will be using drill and practice some of the time, but only because they form a small part of the vast range of devices a remedial teacher uses to rehearse specific skills.

Assuming we are now talking about a much lower number of children, we can seriously consider word processing as an activity.

Again, Folio can be used to build confidence in low ability children and any word processor will help children spot their own spelling mistakes.

Packages like **Easytype** (Sherston) provide an on-screen dictionary from which children can choose words they need and add them directly to the text. If you have a little extra money available a **Concept Keyboard** will enhance your use of **Folio** or **Prompt Writer** (MESU) buy allowing you to set up words or whole phrases at

➤

➤ one touch. At this level it might also be worth looking at some of the more basic adventure games. Apart from those mentioned, Sherston offers several infant level adventures that could be used higher up the age range for remedial help. ESM and C.S.H. provide others.

You will still need to look for software that can be used in short bursts – packages that your special needs children can finish in one session, assuming that is the basis on which they are withdrawn from the mainstream.

It is possible to use software like these short adventures in the classroom if you do not use withdrawal for special needs, but this can cause problems if others interfere.

Extension groups

There is a wealth of material for extension groups. Here you can leave dull practice behind and look for something more challenging. Adventure games are very useful, **Giant Killer** (Topologica) and **L** (Association of Maths Teachers) both provide a wealth of micro-led maths investigations for bright upper juniors.

It is important to make sure that adventures of this type have a save feature so that they do not have to be restarted each session. In all cases, adventure games work best with groups of two, preferably of comparable ability.

For the language, more complex use of word processing may be used, desktop publishing packages like **Typesetter** (Sherston) and **Front Page Extra** (Newman College) could let a group produce a school magazine or newspaper.

A step beyond that would be the exploration of **Logo**, in whatever version your LEA supports, though this may involve a higher investment in teacher time.

Now you have some ideas on which to base the use of very limited resources in your school. Beyond this article the first place to go for help is your local advisory service, and any decision reached needs to be with the agreement of at least a majority of staff.

The important thing is to get whatever equipment you have out into the school and get everyone using micros to some extent. The reason for this is quite straightforward – the National Curriculum.

Already science attainment target 12, as early as level 3, states the children should *be able to retrieve and select text, number, sound or graphics stored on a micro.* This seems to demand the use of databases of some sort, possibly at the top of the infant school.

While the actual IT attainment target in the design and technology document has had some of its teeth removed by being applied to *the brightest children* at each key stage, presumably because of the resourcing implications, any school wishing to implement this AT will need access to machines and teachers who are willing and able to use them.

It's an additional burden a lot of us could do without, but the message has to be: If you're not using micros yet, start now, on your own terms, before someone makes you do it on theirs.

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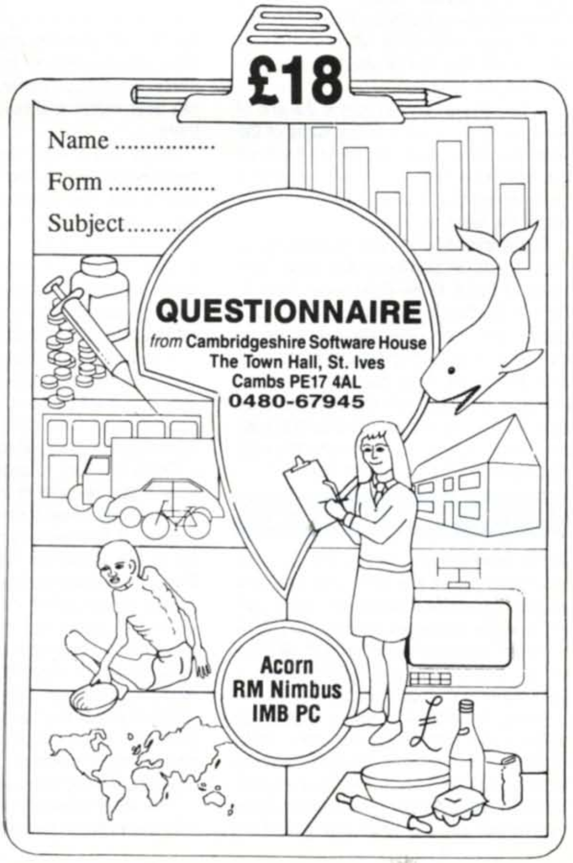
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FERNLEAF specialise in what they call their Drama series of educational programs. Each program is divided into a number of acts, which are really separate parts of the overall package, linked by a common theme. Each section is designed to encourage various styles of thought and the use of different areas of knowledge.

The Railway Drama concentrates on the life of a country railway line which runs through an imaginary location called West Vale.

It deals with the planning and construction of the line – Act One – the provision of a suitable timetable – Act Two – and planning for the decline in traffic on the line – Act Three. Aimed at pupils in the 10 to 14 age range, it is primarily concerned with history but also involves geography, mathematics, language and information technology skills.

The railwayman

The program disc can hold the work of six groups – more can be stored on other discs – and this enables a class to be divided into suitable working units.

As with most good software, the groups will spend much of their time away from the micro. Having planned activities, small concentrated bursts of hands-on time is all that is required.

Act One involves planning and building the railway line. The year is 1870 and you take the part of Joshua Trenport, engineer for the new rural line. As such, you are entrusted with the shareholders' money.

It would be possible to charge straight in and start laying track across the on-screen map of West Vale, but the chances are that the line would fail to satisfy the requirements of local industry, the community and, most importantly, Lord Larch who is the squire of West Vale.

Sensible decisions on where the line should run and how the junction with the existing main line should be organised, will require detailed knowledge of the area and this can be obtained by accessing the data bank.

The information – stored on the disc – is organised in such a way that you can gain easy access to facts about existing communications, farms, industries, landowners, towns and villages.

Altogether there are 16 files of data which can be likened to real files on the shelf in the office of a Victorian lawyer and Joshua Trenport has to pay shareholders' money to gain access to them.

It follows that a file should only be accessed if it is really needed, and all information should be taken from it so that it does not have to be used again. A separate disc, called the Prologue, is available for youngsters to use for practice.

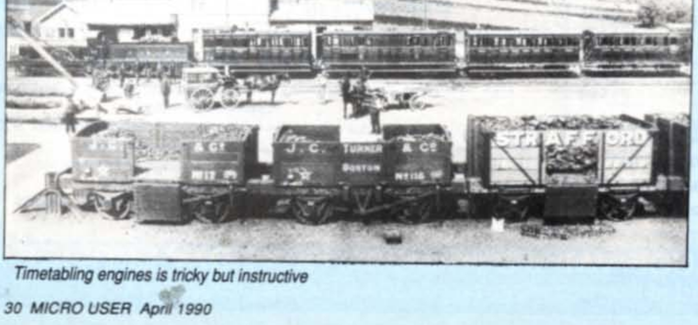
Information gained from data files could be transferred on to the photo-copiable maps of the West Vale area which are provided in the pack. Once all of the information is ready, it is time to plan the route – a tricky business since the line would seem to have to visit all parts of the area, including the awkwardly placed home of the squire.

With the limited budget of 120 units it's not possible to please everybody, but the vital thing is to please the shareholders – played by the micro – who will evaluate your plan, and they are all too likely to throw it out. If this happens, there is an option for the supervising adult to overturn the shareholders' decision.

The groups I worked with, able 14-year-olds, had too much twentieth century knowledge and were too concerned with serving the needs of the mine and the quarry by providing them with a direct link to the docks. The needs of villagers came second and the squire third. This is not surprising as the railway line which borders the school has an endless stream of limestone trains passing by. It led to plans being rejected by the shareholders for not being sensitive enough to the villagers' needs.

This shows the need for a lot of ground work to be put in first – spending time to get pupils thinking as Victorians might have done for example. Part of a Railway Drama project should include careful preparation.

Having completed a line, and had it accepted, various sequel activities are suggested and extra information can be obtained from the disc. These follow-up activities give more breadth to the topic by asking pupils to take the part of various characters. They are essentially off-micro



Timetabling engines is tricky but instructive tasks. And so to Act Two, the provision of a timetable. This activity was found difficult, even by my bright 14 year olds. Three train sets can be used to organise a passenger service on the West Vale line and they must be dovetailed into the existing main line service. It is essential to follow the operating rules for the line – full help is available – and to learn all of the information about travelling times between stations.

Once the information is assembled, the timetable can be written and this will be evaluated by shareholders. The timetable must achieve at least four trains a day each way, an absence of crashes on this largely single track line, a good service for passengers and the milk churns must be collected on time.

My pupils recognised the importance of planning a timetable and perhaps now have more insight into the problems faced by British Rail but, with one exception, they did not enjoy this section.

A successful timetable leads on to more sequel activities.

These again get pupils to think about the way the new railway could alter the lifestyle of local inhabitants.

In Act Three the scene moves on to 1927: The line has long since ceased to be profitable and plans must be made to try to remedy this situation. Two bus services have started up in the area and the line must be reduced in some way to cut the losses. Industry has declined too so it's essential to re-learn about the area by access to new data files.

Sections of lines can be entirely closed or passenger services can be removed – the rail users will no doubt regret the detour to serve the squire's house that was essential in 1870. At least his station can be closed to save money.

Another meeting of shareholders will discuss the plan and accept or reject it, but it is all to no avail.

The materials go on to say that the line finally closed in 1964 as a part of the Beeching plan.

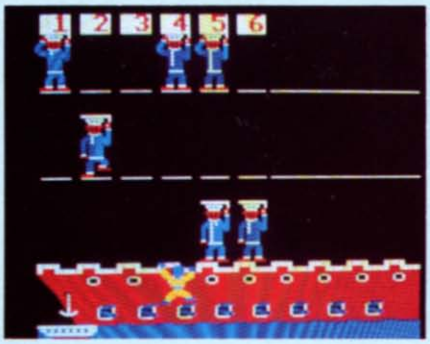
Act Three sequels bring you up to the present day, with bus services now under threat and the emergence of a motorway.

Summing up

The program is very straightforward, with sensible menu options for pupils and hidden options for teachers to gear the program to their own needs. A pack of five pupil books is provided as well as a large bundle of background resource materials.

The ideas pupils have to grapple with are complex and searching and the program is more suited to the top of the suggested age range.

Although secondary schools find it hard to make time for cross-curricular packages The Railway Drama deserves to be fitted in somewhere for the thinking it demands from users.



Matching the sailors to their buttons

Setting sail

When is drill and practice a good thing? Rog Frost takes a look at a simple aid to teaching maths

Product: Maths Pack 1
Price: £9.95
Supplier: Highlight Software,
56 Hendrefoilan Avenue, Sketty, Swansea, SA2 7NB.
Tel 0792 204519

TEACHERS of infants, or maths and science, will be searching for ways to ease the record-keeping burden of the National Curriculum. And Highlight's latest product is designed to help infant teachers with aspects of the mathematics section.

At the same time youngsters aged 5 to 7 will be having fun carrying out simple mathematical tasks. The program can also be used at home, although here, the record-keeping facility would have less value. There are five different games for infants on the disc, but all of them have a common theme of boats, sailors and flags. This all-male scenario raises the spectre of sexism but Highlight assures me that it will redress the balance with future products.

Game one is a matching problem: The task is to select two sailors who have the same number of buttons on their tunics. Supervising adults can set the total number of sailors displayed.

As is usual with Highlight programs, large, colourful characters are moved around the screen to achieve the desired result. On all five games the sounds can – thankfully – be turned off, but for those who use it the reward tune is a very merry ditty. In game two the number of buttons must be matched against a flag which displays a numeral, while games three and four involve counting either in a forwards direction or backwards. In the final game numbers are sequenced by moving flag-waving sailors into the correct numerical order. For the record, the attainment targets covered are level one in AT2, AT5, AT6 and AT8.

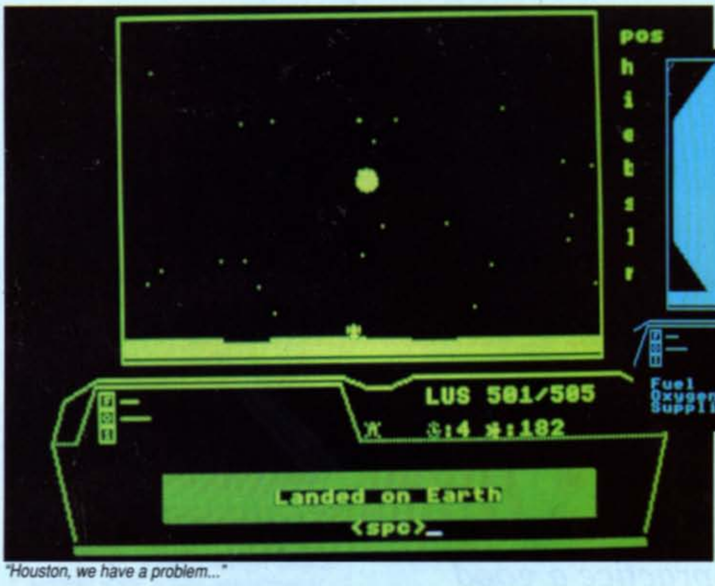
Games can be played without record-keeping, but it is possible to store the names and results of up to 36 pupils. If a player has been selected by name scores are automatically stored on disc.

Accessing the records is easy – it's an option on the main menu. The display of scores makes use of an ingenious profile system which can show the breadth of coverage of the tested attainment targets, as well as progression within one section. It would take a truly dedicated youngster to complete their profile sheet since up to 1600 details can be stored.

All score sheets can be printed out, whether they be the whole class sheet or one for an individual child. Screen colours have not been selected with the Epson-compatible 9 pin screen dump in mind – Highlight could improve this by altering the screen colours before printing. It should be noted that although the disc is protected, it is possible – and advisable – to back up the data file containing the records.

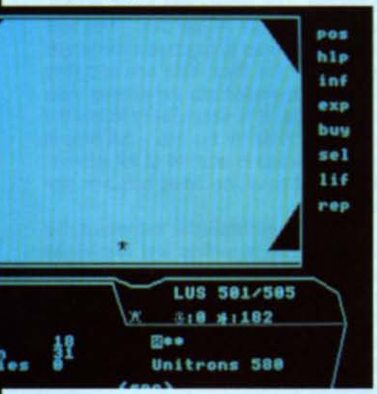
Summing up

I expect that this offering will arouse some controversy. Education experts will probably not like the pack because it is too directed and tends towards the drill and practise method. Classroom infant teachers will probably like it because it's simple to use and the colourful graphics motivate pupils. Home users might also find that their children are willing to use it. Whatever your opinions, it is certainly worth the price.



"Houston, we have a problem..."

Exploring option



Far out!

The National Curriculum calls for some knowledge of astronomy. So Rog Frost takes off with a product that provides more than it promises

Product: Space Apprentice
Price: £22.00
Supplier: Soft Teach Educational, Sturgess Farmhouse, Longbridge Deverill, Warminster, Wiltshire BA12 7EA.
Tel: 0985 40329

NOW that the National Curriculum is up and running in science, it comes as no surprise that software is appearing to cover the more awkward aspects. Space Apprentice certainly has some potential to cope with the astronomy sections as well as the parts linked with information technology.

But I don't think Soft Teach would have produced this product if that was *all* it could do. Like most good educational software, it can be used as the basis for a project which covers many areas of the whole school curriculum.

Space Apprentice is a program to be used by groups of pupils. Much of its purpose will revolve around youngsters discussing and sharing ideas.

The group, who according to the publishers should be aged between 9 and 12, fly a spaceship around the solar system in search of planets, moons and any treasures they can find. Eight such teams can be involved and although they don't play at the same time, their records are stored on the disc and they can all interact with one another.

Teams start on Earth and they are well advised to use some of their money to buy useful items. Assignment One is to orbit and land on three planets – which sounds simple.

Lifting off from Earth requires sufficient speed to get into orbit and the small Galactic Guide or the larger program handbook give the required values for all planets and moons.

Once in orbit it is possible to move into interplanetary space. Following in the footsteps of the old Mission Control at Houston, things like interplanetary space are abbreviated to IPS.

Of course, precious fuel is needed to get up any speed or to change direction and as the craft is flying, the valuable stores of oxygen and supplies will diminish. Run out of any of these and a rescue will be required.

Movement is by means of the cursor keys and the current position of your spacecraft is shown on a coordinates grid.

The vast emptiness of even our solar system will become very apparent if a group involves itself in aimless wandering. Effective use must be made of the on-board navigation system, called COLIN.

This needs to be programmed with information about the planets – facts obtainable from the Galactic Guide. Once programmed, this system can give you the present coordinates of a planet.

So a group uses COLIN and heads speedily towards a chosen planet. When they arrive at the suggested location, the planet has moved on its orbit round the sun. A small amount of manouevering may be required to be able to find the planet and get into orbit around it.

It is possible to land on some of the planets, while others have too hostile an environment – the trusty Galactic Guide gives details of these problems.

Groups may decide to change their map to one of lunar space so that they can chase after a moon of the planet they are visiting. In this simulation moons are very fast movers and planning is required to get the spacecraft to the right place at the right time.

Safely finding three planets and landing on them will be a tall order for groups as they start, since they are only allowed 10 minutes of online time.

The teacher can alter this and I found 15 minutes more suitable. There is an easy to use the program to change the time value and the price of the goods that can be bought or traded.

Assignment Two requires groups to sell cargo to a processing plant on the Moon which involves exploration of the surface and digging for valuable minerals. The processing plant will then have to be found so that the cargo can be sold.

Further assignments introduce more and more difficulty and will call for careful planning. Returns to Earth may be needed to buy larger and faster craft as well as fuel and supplies. Some will involve groups in combat with the rival Zorgans, so weaponry will be needed.

To travel to the outer reaches of the solar system will require careful use of mother ships. These can replenish fuel, oxygen and supplies and also store building materials and equipment – necessary to construct your own bases or processing plants.

Docking with the craft of another group is possible. This can be a fruitful way of sharing supplies or helping anyone stranded. It will also involve learning the Digital Universal Communications Code so that requests can be made.

Should total failure occur, a group can return their craft to Earth, with loss of cargo and any profits made.

They retain their promotion status – promotion is awarded each time an assignment is completed.

The theory behind the program is very good but the proof of the pudding comes when it is put before pupils. I found that they needed quite a lot of help to get started and early attempts to complete Assignment One ended with failure and frustration.

When encouraged to continue, groups did get going and there was intense rivalry between them. The enjoyment was obvious and the pupils were learning far more than the basic astronomical data.

The pupils I used were aged between 14 and 16 and I feel the program is more suited to secondary pupils. It needs a degree of maturity to cope with the rather austere graphics – they serve their purpose but are hardly inspiring – and the number of commands that need to be learned.

The micro/pupil interface is easy to use although there are occasions when precise spellings of moons – such as Enceladus – are needed, and this could be a problem. In fairness, all planet and moon names can be found in the Galactic Guide and correct spelling should be encouraged.

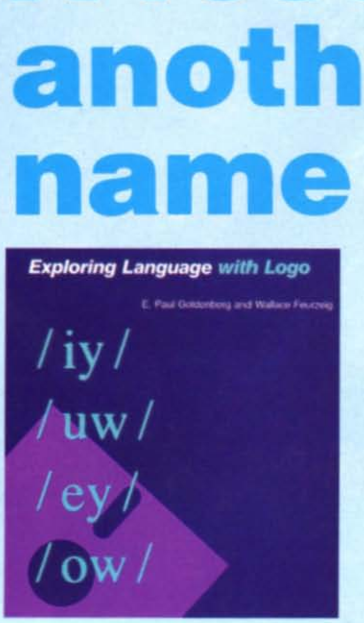
The support materials are adequate with photo-copyable sheets to help with planning away from the micro, recording information, and exploration of planets and moons.

Summing up

I can recommend this program as suitable for secondary aged pupils who will benefit in the areas of maths, geography, science, business awareness and technology by using it. Teachers should remember that a lot of time is needed, mostly away from the micro, to make effective use of the simulation.

A rose by another name

Language is a fascinating subject. Here Lauri Nelson takes a new look at an old and trusted friend in a new environment



Exploring Language with Logo

E. Paul Goldenberg and Wallace Feurzeig

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Product: Exploring Language with Logo by Goldenberg and Feurzeig
Price: £13.95
Supplier: MIT Press, 126 Buckingham Palace Road, London SW1W 9SD.
Tel: 01-730 9208

DURING a year I spent as an advisory teacher for IT much interest was shown in both primary and secondary schools in Logo. They were interested in it as a tool which children could use to discover and exploit mathematical and related artistic concepts, and latterly the National Curriculum documents frequently refer to Logo and firmly stated objectives.

Although the Logotron manual contains some excellent ideas with regard to language, ideas for use in the classroom are hard to come by. This has now been changed by the appearance of **Exploring Language with Logo**.

The book can be bought with or without the accompanying disc but the bad news is that the dialects of Logo for which discs are available from the publishers do not include versions for the types of micros common in education in this country.

However, the programs used in the text are fairly short and are easy to convert to Logotron Logo, so this shouldn't be a problem. From simple beginnings the book proceeds to some quite advanced material by means of full examples, exercises and suggestions for further work.

Simple tasks are undertaken which are gradually elaborated and teased out to give more satisfying results. The first half of the book – The Grammar of Big Things: Sentences, Poems and Stories – Syntax, Semantics and Style – is concerned with computer-generated language of various sorts and the means of achieving solutions with the *how* being very firmly subordinated to the lingustic *what*.

In other words the authors' objective is the production of language, not the compilation of a list of Logo commands. This is the main reason why I would strongly recommend this book: It is written for people interested in language, not for buffs.

Technical terms are explained so that the layperson can understand them with no prior knowledge of Logo – or even computing – being assumed.

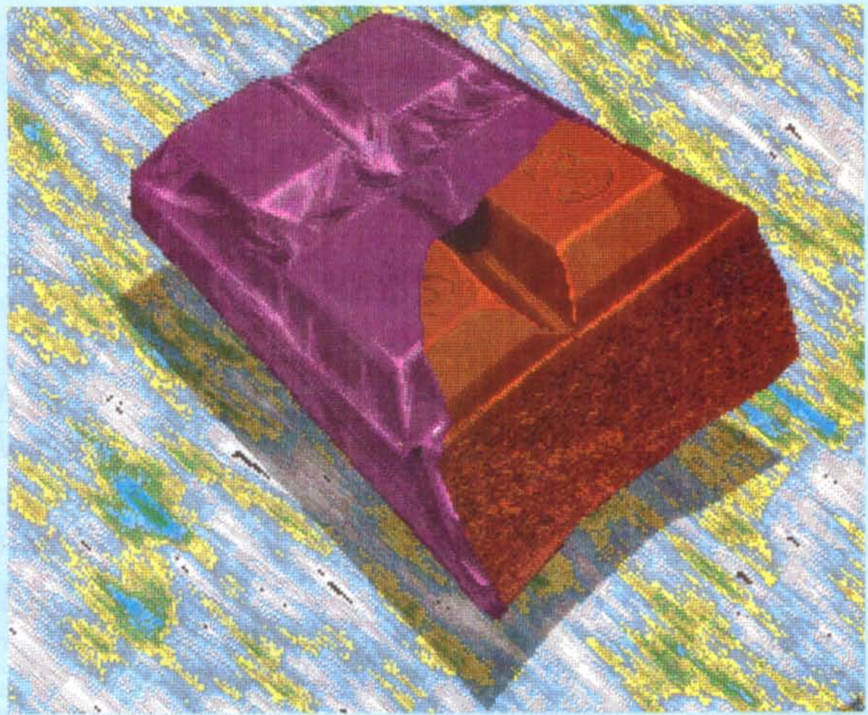
The second half of the book is an added bonus which will cause you to return to it again and again. It provides the stimulus to explore many extra facets of language.

Not only does the text, as well as the programs, offer insight into the history, spelling and pronunciation of English, but an opportunity is given to look at examples of many others. I can see the ideas in the book being further developed in English and foreign language classes. As a modern language teacher myself, I shall certainly be trying.

Summing up

What comes through, time and again, is the authors' infectious enthusiasm for language and knowledge of modern developments in linguistics. Add this to their ability to explain sometimes quite complex topics in a clear and comprehensive manner, and there is something here for everyone. Definitely a book to be returned to again and again to deepen your understanding of the way language works.

Steve Bruntlett explores the capabilities of a new art package with a plethora of options



Results from Arcol Professional

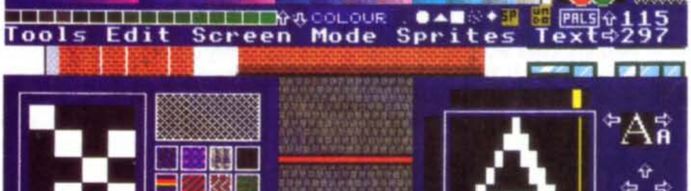
On a wider canvas

Product: Arcol
Price: £50 single user copy; £250 site licence including use of Arcol on stand alone or network machines.
Requirements: Archimedes series or BBC A3000
Supplier: Tap Consortium, expLAN, 34 Drake Gardens, Tavistock, Devon Pl19 9AT.
Tel: 0822 613868

ARCOL is a painting package running in Mode 13 which provides 256 colours and square pixels. The multi-user version is fully networkable via Econet – probably its main selling point.

The separate elements of the package – pictures, sprites, patterns, fonts and so on – can each be held on different filing systems and drives, including Ram FS and hard disc, allowing maximum flexibility. Arcol can be bought as a multi-user or single version package and operates under Arthur 1.2 or Risc OS.

The software features user-defined brushes, 16 sub-palettes for colour cycling, auto selection of colour spreads for smooth shading effects, sophisticated sprite handling with resizing and reshap-



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END
CLEAR
RESTOR
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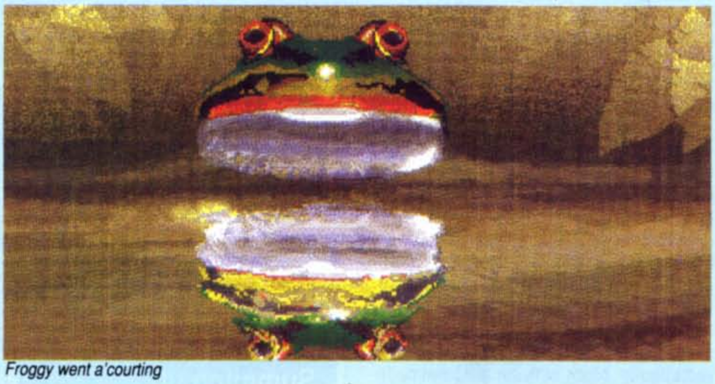
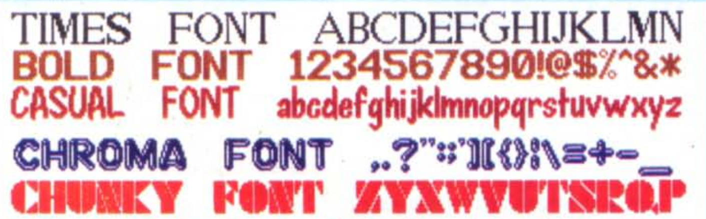
SHEAR
ROTATE

Font Editor in use



Froggy went a'courting



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BOLD FONT 1234567890!@$%^&*
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Outline Fonts are not a feature

Workcards for courses

Tap now provides a set of workcards with all site licence versions of Arcol. Aimed at the design and technology courses of the National Curriculum, the nine photocopiable cards cover:

- Colour separations for screen printing.
- Creating reflections.
- Shadows and shading.
- Fading.
- Metallic effects.
- Coloured glass.
- Foliage.
- Kitchen Design.
- Creating borders for DTP.

Single-user licence holders may buy the worksheet pack from expLAN at £12. Also just released is TABS, which takes you one step on from Arcol. It is a three-dimensional drawing package which, as well as presenting images on screen, will unfold objects and print/plot them in flat form, complete with tabs to show where parts are to be glued together. This will enable a scale model of the designed objects to be made.

You can also take the flat parts of the objects back into Arcol to render them into colour.

ing, pattern editor, font editor, user adjustable alignment grid, zoom x2 to x20, text import, recolouring, shading, shade fills and colour wash effects.

The package I had for review was the stand alone version which cannot be used on a network, as several pieces of code are absent from it. Arcol consists of a video style case with system disc, manual, key strip, registration card and worksheets on DTP, colour seperation and a project for National Curriculum design and technology. The pictures supplied are mostly good examples of what can be done with this package – some are used to illustrate this review.

The options to use different filing systems and drives are set up through a configuration file. The A5 manual is clear and well laid out, though some of the illustrations are a bit dark.

Screen memory and applications memory have to be increased using the task display on the Archimedes DeskTop before the program can be run – which really shouldn't be necessary.

Double clicking on the Arcol icon in the filing window starts the program running; alternatively the program can be auto-booted.

Once Arcol is up and running, a black screen with a menu bar across the top appears containing a 256 colour palette. This includes a colour indicator showing the current foreground and background colours, pattern indicator, 16 colour palette which is used for shade filling or colour cycling, mode indicator, brushes, undo, the Pals icon which brings up the palette edit menu and X Y coordinates for the brush in use. Brushes can be altered in size up to the full size of the screen and shaped brushes are possible using the plain coloured mask for a given sprite. Sprites can also be used to form a sprite brush.

One of the most interesting developments in this package is the use of a double height screen. The bottom half can be used as a scratch screen for storing bits of picture or as part of a double sized picture which can be printed out nearly full A4.

On the bottom row of the main menu are headings for sub-menus for the tools, edit, screen, mode, sprites and text options, some of which have further sub-menus.

The tools allow you to draw freehand with a continuous line, draw with dots or lines, flood fill an area with colour or pattern, shade fill an area, spray a variable circular area using the current brush or sprite or produce geometric shapes.

The shade fill option provides facilities to shade across an area smoothly, in stripes or with circular bands, all with varying degrees of dither using all or part of the 16 colour palette.

Shapes will work with brushes and mode effects, for example, an outline circle could be produced using a sprite or a brush. Corners of shapes can be dragged to final positions at any time before they are fixed.

The sketch, line and shade fill options can be chosen from the keyboard as well as from the tools menu.

The edit menu allows you to zoom, edit patterns, use the gridlock, clear the screen, undo the last alteration and operate the marker. The zoom option will magnify any part of the screen and you can work on both the original screen or the part that is magnified with any of the tools. Changing the colours of the 28 patterns and save or load banks of patterns to and from disc is achieved with the pattern editor.

You can define a grid whose intersections will attract the vertices – or control points – of any shape you create. The undo option allows you to cancel the last alteration. You can also hold the undo by pressing H and any alterations from that time will be removed when the undo function is selected.

The marker option lets you draw lines or shapes from an anchor point anywhere on screen which is useful for perspective drawing.

The screen menu allows you to save and load single or double height pictures, print a picture, select, edit, load and save palettes, and select input from mouse and Graphtec or Genius digitising tablet, which shows forward planning. Pictures can be printed out in colour or monochrome at normal or double size.

Arcol pictures can be output via Epson-compatible monochrome or Integrex Colourjet 132 printers, either locally or on a network and colour separations can be produced automatically for offset work or screen printing. This option produces four black and white printouts with location

➤

crosses and colour plate names. Each print is a calculated colour separation of the cyan, magenta, yellow and black components that form a picture on screen.

The main problem with the colour printout on the Integrex Colourjet 132 is that the results look very pale on high quality paper, even using the high density option which is provided for printing on acetate. It takes five minutes, due to the amount of information which can be sent through a network system to the system printer.

Arcol's low resolution dump prints all 256 tints on a double size printout using dither patterns and takes 15 minutes. This is especially important for colour separations as the component pictures need to be accurate otherwise the final product will be an inaccurate representation of the original screen picture.

If you use standard quality paper on the Integrex, the ink will soak into the paper and produce a darker picture, but it won't be as clear as a printout on better paper. So if you use this program on a regular basis you'll need standard printer paper rolls. You can also print out using the Acorn Integrex driver or screendumps from other graphics packages.A number of modes affect how the current brush paints with the colour. The first four – solid colour, OR, AND and invert – can be used in conjunction with the fifth mode *cycle* which allows colours to cycle continually or in steps while in use. The other modes are mainly special effects selected from a submenu or via the function keys.

The recolour mode works with the shading, anneal, smear, wash, blend and step modes. This allows up to 16 colours in a picture to be recoloured, and is specially adapted to use the 16 colour palettes in creating an infinite number of colour effects. I found this a fascinating part of the program to work with and it is certainly worth spending time exploring the possibilities it offers.

Sprites can be cut out freehand or in a rectangular block with an automatically created mask and can be manipulated in a number of different ways including bending, flipping, re-shaping, twisting, filling, trailing, rotating and expanding. Some of these options produce very interesting results and, like the mode options, have to be explored to be appreciated.

The twisting trailing sprite option is fascinating to watch, but together with the rest of the sprite and mode options it needs careful thought if the result is to be a meaningful image and not just a technical tour-de-force.

The text menu allows you to type text on the screen or load text from disc in any of 13 different fonts. Small documents may be loaded into Arcol and fed into the picture as long as they are in Ascii format no longer than 4k. Pressing the spacebar feeds the text on to the screen, which will automatically move to the next line if it runs off the edge. If 13 fonts aren't enough a font editor is available under this option.

A number of alterations can be performed on individual characters to achieve the required style or effect. New fonts can be created and saved for later use. There are too many features to go into here in detail, but it looks to be very comprehensive.

Summing up

Arcol has the feel of an 8 bit BBC Micro program albeit with the extra colours. The main menu across the top of the screen is off putting though it can be switched off at any time. The rest of the menus are excellent though the way the options flash when selected is unnerving at first.

The complete lack of Risc OS functions is annoying – anti-aliased outline fonts produce better text than those provided, and at any scale too – but despite all the niggles, Arcol provides superb facilities and is excellent.

THE MICRO USER **Reader offers** THE MICRO USER **Reader offers**

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MU4

A very good read

Frank Jukes finds some software that makes annotating books a doddle

Product: Hyperbook
Price: Hyperbook Reader £45
Science & Technology £25
Hamlet £15
Twentieth Century History £15
Supplier: Longman Logotron, Dales Brewery, Gwdir Street, CB1 2LJ
Tel: 0223 323656

HYPERBOOK is a software package published by Longman Logotron for use on the Archimedes series and BBC A3000 to enable text such as books and source material on disc, to be read, searched and edited. Essentially it enables you to do more effectively on the micro what you already do with printed texts.

From the electronic pages the material can be browsed through quickly and simply while footnotes, glossaries and indexes can be created and used.

Hyperbook's system allows sophisticated searches of the text to be made and the indexes it produces may then be used to develop researching tools for cross-referencing. What is unique about these indexes is that they are *yours* and their entries refer only to those things which you are interested in and form a hierarchical record of your thought processes.

One feature you may find unsettling at first is the way in which the indexes are arranged – out of alphabetical order. This is not a problem in practice as they follow the sequence of ideas and reflect the way you have approached your examination of the text.

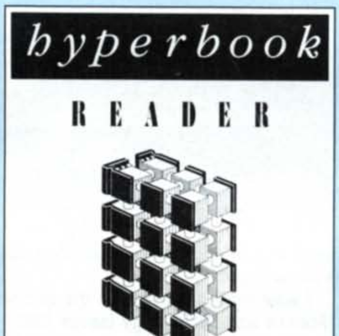
Also very different, but also very useful, is the ability to have a number of different indexes all relating to the same text, each one created separately and for a specific purpose. With a conventional book, page references from the index must be looked up, the text read, the index checked for cross-references, cross-references read and so on.

I usually find that quite soon I have forgotten precisely what I was looking for in the first place and my search has gone off at some often interesting but unproductive tangent. Even worse, the book develops a mass of paper page markers which gradually and silently remove themselves from their assigned positions.

As a contrast the Hyperbook index consists of entries created by asking the program to make a series of searches to match a word, phrase or relationship which you have specified.

Once complete it becomes an entry in the index and each contains references to the places in the book where the information is to be found. The power of the indexing system does not stop there however, for it is possible to have six primary entries in an index, each with six sub-entries, each with six sub-sub-entries and so on.

The searches may be quite sophisticated. While it is possible to search for a simple match to the search specification, it is also possible to use an AND search or a BUT NOT search. The former uses two specifications such as "Acorn" AND "micro" which must appear within a given area of text for an entry to be made, while a BUT NOT search such as "Acorn" BUT NOT "oak" means that references are required for places in the text where *Acorn* appears without mention of *oak*.



hyperbook

READER

A NEW DIMENSION IN TEXT-BASED RESEARCH AND INVESTIGATION

The extent of the area of text over which a search is matched is selectable and may be set to between one line and a whole page. In all there are three kinds of search and the indexer can look for up to 10 alternatives at once and search specifications can include single words, phrases, numbers, part words with wildcards or a mixture of them all.

If this automated power isn't enough, a manual search is also possible with no search specification. This is not as odd as it at first seems as it may be very difficult to design a search specification for a particular reference or you may wish to create a series of entries for others to follow later.

Hyperbook's power is also revealed in its ability to do four searches at the same time and, while these searches are going on, their progress may be monitored or the book may be read. The searches are fast and only appear to slow when pages are being scrolled.

Once the search has started and the first reference in an entry has been located it is possible to look up the text it has found. As each part of the developing index is selected the relevant portion of the text is automatically displayed.

In addition to searching text and creating indexes Hyperbook offers the opportunity for authors, or readers, to create and save notes and glossaries for texts, to examine the vocabulary used within the text and to produce printed abstracts selected by the searches.

Notes are indicated by the presence of a musical note symbol on the right-hand side of the page. Usually these would be provided at source by the author but they could also be added later by a teacher wishing to help students with a particularly difficult passage or by someone with a need to add their own notes close to the original text. Actually adding notes is very easy: The cursor is simply moved into the right-hand margin and Return pressed to open a dialogue box into which the notes are typed.

If the book contains unusual or specialised words a glossary may be used to provide a definition which is revealed by simply moving the cursor to the word and pressing Return. These may be included in a glossary, and this can be a significant help. For younger readers, however, the presence of difficult words may mean that the book is beyond their abilities.

To help discover if this is the case, the vocabulary function provides an opportunity for a given range of pages to be examined and for each distinct word to be listed with trivial words such as *and, but*

➤

➤

and *then* excluded from the examination, and the lists displayed in alphabetical or frequency order.

This makes the function extremely useful but, with what can often be a long list of words to look at, it would have been a help if the window in which the words are displayed had been bigger. To avoid this problem the list may be printed out or saved to disc and the difficulty of the text more easily assessed. Words for inclusion in a glossary may also be identified by using the same list.

The system sets out to retain the layout and feeling of a traditional book within a contemporary hi-tech environment and, although it is a difficult task, it succeeds quite well. At last, dog-eared pages could be something of the past.

The text is read from a large central window above which are access points to Hyperbook's drop down menus and below which is information on the various searches and indexes.

All of these features can be accessed by using the mouse or the keyboard and, of the two, I much preferred the latter. The mouse had a coarse, jerky feel to it and scrolling within vocabulary windows, for example, was relatively difficult.

Drop down menus are used extensively and their selection and choice within them is made by single key strokes with simple colour highlights on the alternatives to help speed things up even further.

The menus and colour highlights are really the only things which are good about the user interface. On the whole it reminded me of the early days of the BBC B and owes little to the sophisticated Wimp environment to which we are now accustomed.

Hyperbook was originally written for the IBM PC and its clones and has been versioned for the Archimedes. If this is the reason for the poor screen display it's a pity, as the package is going to be very popular and will be around for a long time. It deserves better than a PC-style environment – and so do the users.

At present Longman Logotron's published texts, complete with built-in pathways, glossaries and annotations, range from *Pride and Prejudice* to *Science and Technology Issues 1988* and from *Hamlet* to *20th Century Historical Sources* with others such as *The Gospels* and *Pollution File* extending the range even further.

Not yet available – but, I am assured, imminent – is the text of the new Education Reform Act. Senior staff in schools, governors and local authority staff will find it very useful and I for one look forward to being able to check the legislation quickly and easily when queries arise.

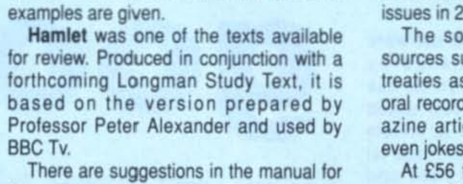
Published texts such as these are only the beginning, however, as a separate Hyperbook Authoring System costing £20 will allow users and other third parties to create their own Hyperbook texts.

As with the Hyperbook Reader software, the text files are very well documented. Short, well-written booklets give clear information on loading and using the system as well as acknowledgement of the various sources from which the texts have been compiled.

Some suggestions are also made on how to start searches that will lead to the creation of a useful index and sensible examples are given.

Hamlet was one of the texts available for review. Produced in conjunction with a forthcoming Longman Study Text, it is based on the version prepared by Professor Peter Alexander and used by BBC Tv.

There are suggestions in the manual for thematic searches such as family relationships, revenge and madness, but I am not convinced that it provides a good example of how the system will be used by the vast majority of students – researching such a work is quite a difficult and abstract task even at A level.



```
  Ay,                          beauty will sooner
  tra                          it is to a bawd than
  the                          nslate beauty into his
  lik                          a paradox, but now
  the                          id love you once.

OPHEL
  Ind                          believe so.

HAMLE
  You                          me; for virtue cannot
  so                           ut we shall relish of it.
  I l

OPHELI
  I was the more deceived.

HAMLET
  Get thee to a nunnery. Why wouldst thou be a
  breeder of sinners? I am myself indifferent honest,
  but yet I could accuse me of such things that it
  were better my mother had not borne me: I am
  very proud, revengeful, ambitious; with more
  offences at my beck than I have thoughts to put

Page:  55 of  127
Ref :   1 of    4
```

Using the search facilities of Hyperbook

I was much happier with the text on **Science and Technology Issues 1988** – it's fascinating. Provided on two 3.5in discs, it consists of articles selected from the Financial Times Profile database with the sources within Profile restricted to The Financial Times, The Guardian, The Washington Post and TASS.

The articles are in chronological order and are intended to support courses such as GCSE, AS level, A level and B Tech.

Example indexes are included on the discs and topics covered include energy, Earth, agriculture and medicine amongst others.

The manual includes suggestions for using Hyperbook within the classroom. Teachers could, for example, print extracts for inclusion on student work sheets while students themselves could initiate literature searches for work towards B-Tech National Certificate Science or search for information needed for GCSE extended essays.

Guided investigation of scientific literature within the classroom to enhance traditional science has, until now, not been easy. With an Archimedes in the room Hyperbook changes all that. To use the medium for research at home would, of course, be much more difficult than it would be if using the printed page. Only many more micros in homes can alter that.

Twentieth Century History – The World Since 1900 is similarly impressive and is designed to explore 21 of the key issues in 20th century world history.

The sources include conventional sources such as government papers and treaties as well as memoirs, diaries and oral records, newspaper reports and magazine articles, songs, propaganda and even jokes.

At £56 for the Reader Software and a sample *Chronicle of the Twentieth Century* text, Hyperbook is not particularly cheap. It has moved away from the costs schools are used to when buying software for their 8 bit BBC micros, and the publishers certainly don't share the same philosophy as those of the remarkably low-priced KEY database.

The prices of the texts, between £15 and £25, do however make up for this as does the Hyperbook demonstration disc. Called the Green Disc and costing just £5, it contains, naturally enough, articles on environmental issues.

The disc provides a way for schools to evaluate the system at minimal cost and if the full system is subsequently bought the £5 is refunded against the cost.

For many of our schools the introduction of the National Curriculum is now creating increasing demands on time and finances.

Such new initiatives as Hyperbook will help them to deliver that curriculum, but it is important they can be introduced at reasonable cost and used by both teachers and their students quickly and easily without need for long or constant reference to a manual.

Hyperbook satisfies these criteria and, with only minor reservations about the screen display and the use of the mouse, I can thoroughly recommend it.

Summing up

Education is all about preparation for a rapidly changing world. Hyperbook gives students in our schools opportunities to search the literature generated by that world in a way that has never really been possible before.

Hyperbook's simple yet flexible approach to investigating published material collected from the highest quality sources, and also the prospect of including home-grown material via the Authoring System makes the system even more exciting.

MIDNIGHT GRAPHICS

Multitasking Colour Sprite Dumps for the Archimedes

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- Scaling available - any ratio is possible.
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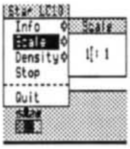
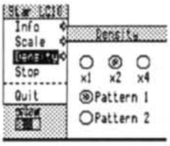
The printer driver uses a dithering pattern to produce the required colour on the printout. The first pattern produces bright sharp colours, very similar to those on screen. The second pattern is used to reduce the 'moire' effect but results in more subdued colours.

A great deal of thought has been put into the patterns to produce the optimum results, bearing in mind the method the LC10 uses to perform it's colour printing. Experimentation with the two possibilities will result in improved performance.





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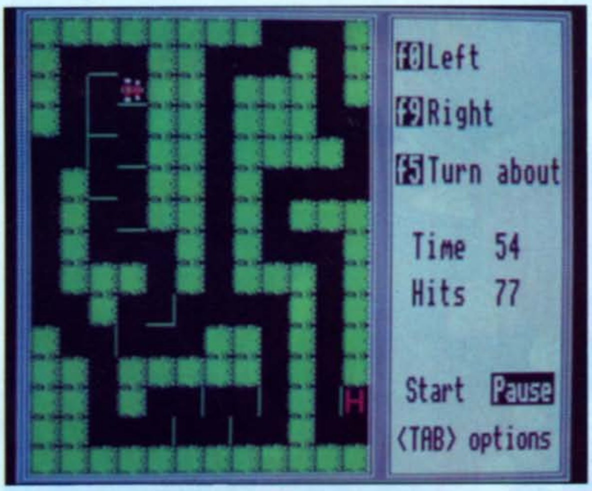


The standard user interface inspires confidence in the pupils

As seen on TV

Phil Taylor takes a look at software linked to an educational TV programme

PROVIDING class material to accompany television programmes is a popular pastime of producers and certainly worthwhile from the teacher's viewpoint. Central TV is no exception and has used the talents of GSN to develop an accompaniment to its VideoMaths series.

Every program in both packs follows a consistent screen display, which helps children to work confidently with little adult help. The display area fills much of the screen, with messages and cues appearing in a column on the right.

Unfortunately, the programs share very modest sound, the full range being little more than beeps in several tones.

Each disc loads to a menu of five titles plus a further option to set up a printer. The program title is selected by the spacebar and the choice confirmed by pressing Return.

On the first disc **Abacus** appeared to be of limited use, merely adding or subtracting one repeatedly from a starting number chosen by the child.

The option to work in bases other than 10 makes it more useful, but only those less than 10 are available. I would have thought that hexadecimal might have been a useful addition, reflecting the demands of the National Curriculum.

Weaving allows you to try out various ideas in textile design on the screen before committing them to other media. Up to 12 vertical lines can be drawn and subsequently woven by a similar number of horizontal lines.

Colours can be chosen and then the weaving may begin either manually or by an excellent automatic system.

I shall skip over **Driving**, which shows how little some software has evolved since the M.E.P. Primer materials that schools received years ago with their first BBC Micro.

Much better is **Pattern**, which was undoubtedly the most popular one in use in the classroom.

A basic 8x8 or 9x9 pegboard is turned into a tile by drawing lines in elastic band mode. These lines can then be reflected about any of four axes, and filled using a maximum of two colours plus a white or black background.

This pattern can then be repeated on a 9x7 screen display, although the squares tend to look squashed and much detail is lost.

Screens can be dumped to a printer, although many of the programs use colour as an important feature, so a black and white dump is of limited use.

I found **Surfaces** to be an original and stimulating program but tremendously frustrating. The player has to drive a boat around an irregular lake, with islands placed to annoy.

Using controls which rotate direction through 45 degrees to left or right, the idea is to enclose as much of the lake's surface as possible, while not capturing any islands. It may sound easy, but it develops coordination, spatial awareness and logical planning.

There is also an accelerator key, which raises the possibility of enclosing the largest area within a certain time, thus combining a number of different skills within the same activity.

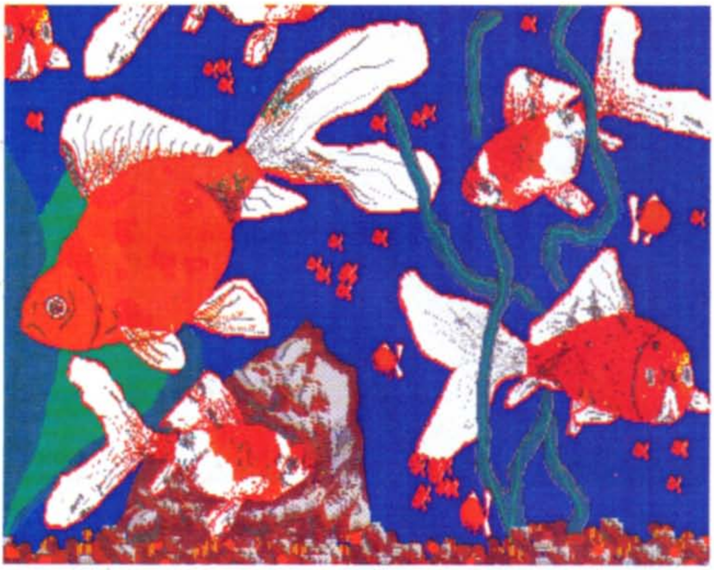
Disc two had a similar mix of good and not-so-good, with **Bounce** being the pick of the bunch. This allows investigation of relections, by bouncing a ball around inside a frame, selected from a square, rectangle, circle or triangle. As in each of the programs, some good ideas for extension work are detailed in the accompanying booklet.

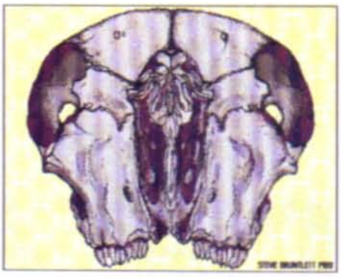
Count allows up to three manual or automatic counts to be made, showing the current rates per second, minute and so on up to a year. One of the examples involves using the program to count cars, lorries and vans passing the school, with three children each pressing a specified key. The display is constantly updated to show, for instance, how many cars might pass within an hour.

Next is **Squeeze** in which a blob is trapped and squashed between four lines moved by the cursor keys. This can produce a wide range of rectangles, all having a simular area, although it can also produce silly results, such as a rectangle of 35 units by 0 units having an area of 9 square units. Neither **Shadows** and **Circles** were at all memorable and the mixture on this disc was again only fair overall.

Summing up

The screen displays are colourful and the two packs cover a wide range of activities including some novel ideas. However, no colour printer routine is built in and the use of sound is very poor. Combine this with the slow speed of the screen drawing and you end up with a package which combines originality with mediocrity.





Second time around

Two years after its initial release, the first art package for the Archimedes gets a facelift. Steve Bruntlett checks it out

Product: Artisan 2
Price: £59.95 or £29.95 if you return your original disc
Supplier: Clares Micro Supplies, 98 Middlewich Road, Rudheath, Northwich, Cheshire CW9 7PA.
Tel: 0606 48511

WHEN first released the Mode 12, 16 colour art package Artisan was the best around – in fact it was on its own. Soon it was superceded by Mode 15 editors and then Risc OS appeared and Artisan took a back seat with its single task, non-wimp approach.

Now Clares has revamped the original program, releasing it as Artisan 2 and bringing its specification close to that of its big brother, Pro-Artisan. Plus making it easy to operate as part of the Risc OS working environment.

The Artisan 2 package consists of a well-produced manual containing a quick guide as well as a complete reference to all the program's features.

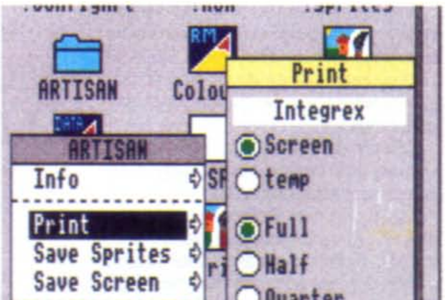
It's easy to follow and contains exercises in most sections which you can go through to make sure you are familiar with the chosen options.

The software is copy-protected in that you have to select colours from a grid – which is in the manual – given two sets of co-ordinates when the program first runs. This seems perfectly reasonable and isn't a problem unless you mislay your manual.

The software comes on a Resource disc containing the Risc OS printer drivers together with four Artisan demonstration screens and the system disc contains the programs and icons used by Artisan 2 as well as further demonstration screens. The latter also contains the colour separation program !SPOT, which is run independently of Artisan 2 and is used to provide black, cyan, magenta and yellow separation screens for process printing.

This I believe has been provided in response to requests from schools and colleges needing to use Artisan as the basis of screen printing. The !SPOT program can also be used to produce spot colour separation screens.

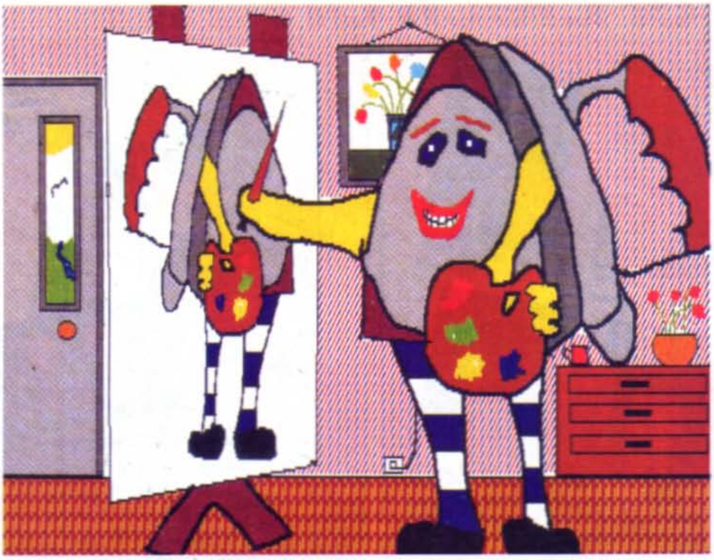
The second idea Clares has implemented in response to requests from education establishments is sticky menus, which now only disappear when you start an operation, rather than when you move the mouse pointer off them.



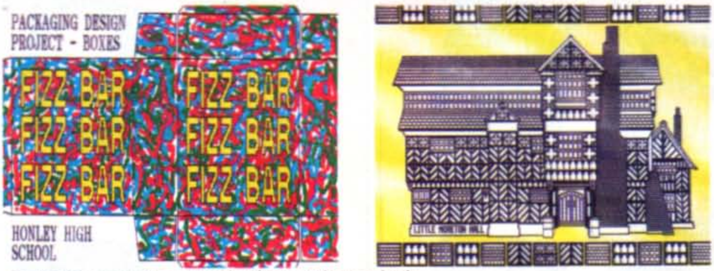
The extensive print options

A third idea is a very useful utility called !CONFIGART which can be used to deselect any combination of options from Artisan 2 to make the program easier to use by younger children or pupils who you want to work with only one menu of options at a time.

Artisan 2 resides on the menu bar like other Risc OS applications, but unlike most of them takes over the whole screen when activated. Clares has taken this path in



The menus can be limited for use by younger children



Duplicating areas of the screen has been made very simple

response to the general view that users don't want a window to work in, as this means scrolling the picture and not being able to see all of it at the same time.

You can move in and out of Artisan 2 without losing the picture so that you can use other applications on the menu bar. Screens can be saved and loaded using Artisan 2 in the same way as in Artisan or alternatively by dragging the icon for the screen to and from any directory viewer.

When a Risc OS printer driver is loaded a print menu is available allows you to produce a specified number of prints at either full, half or quarter screen width size.

I don't like the high resolution printouts produced with the Risc OS Integrex driver, they're very dark and also smaller than the normal size. And the low resolution printouts are not worth bothering about. I much prefer to use the Artisan Support Disc for good quality hard copy – which is how the printouts accompanying this review were produced.

Looking at the new features in order, the Draw menu now contains the fill sub-menu of Pro-Artisan in modified form. This is accessed by clicking Adjust on the icon and allows you to produce sprite, circular and line fills and vertical, horizontal and radial fills in either graduated or stepped formats. The Banding menu now has a Gridlock option accessed by clicking on the menu icon with Adjust. When drawing with this on, lines and shapes snap to the nearest intersection.

The grid size is definable both horizontally and vertically and can be used in combination with drop patterns, which I'll deal with under the new features of the Toolkit.

The Gridlock menu also has an option to set a fixed point anywhere on or off the screen and use this when banding lines – useful for perspective drawing.

The Sprite menu now includes the same options as its Pro-Artisan equivalent. Cut Sprite allows you to grab irregular-shaped sprites with an automatically generated mask. This lets you plot the current sprite shape as a single colour which you can use for producing drop shadows and so on.

You can also scale sprites to any size and proportion and view the currently loaded ones directly instead of by name.

The Artisan 2 Toolkit now has most of the Pro-Artisan features and includes new fonts to take the number provided to 26.

Other options include an command line window so that you can enter and execute star commands and a Global Magic Brush that lets you band a box over part or whole screen and change the colours using the current Magic Brush set of colours selected in the Draw menu.

So, for example, you can reverse colours, which you can't do directly with the Draw menu Magic Brush.

The Sprite Screen Plot is used to create textile designs, and the sub-menu is accessed by clicking Adjust on its icon while Select implements the options selected from the sub-menu.

The Sprite Screen Plot allows you to produce drop-repeat patterns of different kinds which can be related to the gridlock option of the Banding menu.

Sprites can be plotted in their original size, plotted at the intersections of the currently selected grid or scaled to fit the currently selected grid. Sprites can also be offset by half and flipped vertically or horizontally.

This is a very useful option, and will no doubt inspire many to become involved in textile design.

Other practical uses of this Sprite Screen Plot option are in the creation of regular repeated areas of elements which would help produce pieces of work such as the illustration of Little Moreton Hall much more quickly than repeating each sprite by hand.

Areas of texture could be produced from sprites very quickly and then collaged together to create a more complex image.

The last new option on the Toolkit menu is Distort, which lets you distort and scale the currently selected sprite into any enclosed area of flat colour.

It is deceptively simple to use but is one of the most powerful functions in the package.

The Disc Filing menu of Artisan 2 has a fifth column over and above those in the original program with which you can create directories which may be especially useful if you are using Artisan 2 on a hard-disc system.

The only criticism I have of Artisan 2 is that you can't save compacted screens. This is implemented on Pro-Artisan and saves a great deal of disc space when using this kind of program with whole classes of pupils.

Summing up

Having worked with Artisan and then Pro-Artisan since they were first released, I prefer Artisan 2. Even though I can only use 16 colours at a time, I like being able to choose my own colours from a palette of 4,096 and not being restricted to the 256 of Mode 15, which are rather muddy.

Artisan 2 is a very user-friendly package which I look forward to using on a long term basis.

It greatly extends the original features of Artisan and will enable many schools to develop the computer-aided art side of the curriculum and also enable individuals to develop their creative skills.

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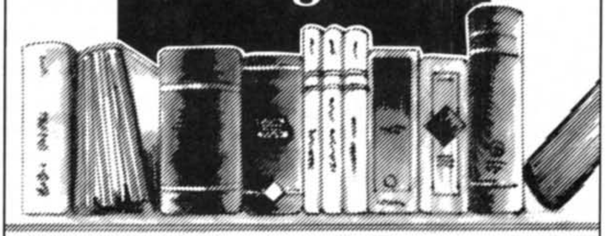

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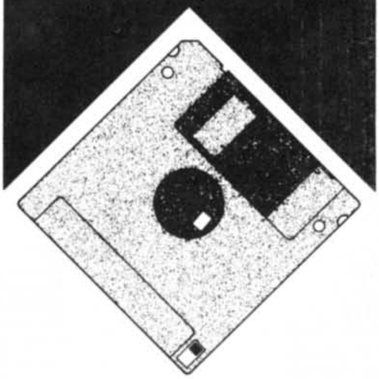

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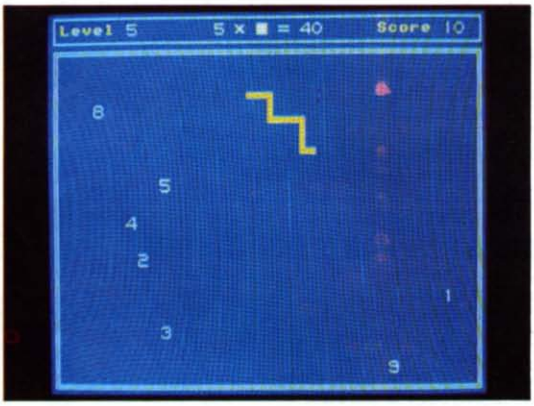

Martin Sann offers an old snake a new skin – and in the process gives your brain a good old workout

WHEN actively involved in two related but essentially different problems your brain does better at both – parallel processing is its strong feature. This simple game enhances and illuminates that capability by taxing one part of your grey matter that is busy managing fine motor adjustments while simultaneously stretching another area to its limit with mathematical logic.

Eventually you'll need both sets of skills working at a suitably high standard to get top scores.

All you have to do is guide the worm round the screen and eat the right numbers using Z and X to go right and left and / and : for down and up.

If the number the worm eats is the correct one you score points and the worm gets longer. Be careful not to crash into the wrong number or the edge of the screen or the worm itself.

To reverse the direction of the worm you have to go round a bend.

If Easy is selected the length of the worm is limited, but the hard game allows the worm to get indefinitely long at a fairly alarming rate.

There are nine digits for the worm to eat, each part of a mathematical equation visible top centre of the screen.

There are eight levels of play. Levels one and two use addition, three and four subtraction, five and six multiplication, seven and eight division.

You can start at any level and have the choice of three worm speeds one to three, that is slow to fast. Higher points are gained for the faster speeds and double points are available for the hard game.

Just type in each listing saving the first as Wormy1 and the second as Wormy2 – you can ensure you've made no typing errors using the checksums.

Lising I

```
   10 REM Wormy1
   20 REM by Martin Sann
   30 REM (c) The Micro User
   40 MODE7:VDU23;8202;0;0;0;
   50 C$=CHR$131+CHR$157+CHR$132
   60 ENVELOPE1,2,-1,0,0,4,0,0,128,0,-1,
-1,128,112
   70 FOR s=1TO16:s?&37F=0:NEXT:L%=0
   80 PROCinfo:PROCchars
   90 CHAIN"wormy2"
  100 :
  110 DEFPROCinfo
  120 PROCbig(C$+FNs(5)+("W O R M Y   N
U M N U M"),0,1)
  130 PRINTTAB(2,5)"Work out the missing
 number and eat it"
  140 PRINTTAB(3,6)"by guiding the worm
with these keys"
  150 PROCbig("Z = LEFT",9,9)
  160 PROCbig("X = RIGHT",22,9)
  170 PROCbig("/ = DOWN",9,12)
  180 PROCbig(": = UP",22,12)
  190 PRINTTAB(3,15)"Choose the EASY gam
e or the HARD one"
  200 PRINTTAB(4,17)"There are eight lev
els of play and"
  210 PRINTTAB(6,18)"three speeds (1 is
the slowest)"
  220 PROCbig(C$+FNs(10)+"PRESS ANY KEY"
,0,22)
  230 G=GET:CLS
  240 PROCbig(C$+"1 for the EASY game  "
+CHR$156,8,10)
  250 PROCbig(C$+"2 for the HARD game  "
+CHR$156,8,14)
  260 REPEAT:G=GET-48:UNTIL G>0 AND G<3
  270 Z%=G
  280 ENDPROC
  290 :
  300 DEFPROCbig(A$,X,Y)
  310 FOR line=0TO1
  320 PRINTTAB(X,Y+line)CHR$141+A$
  330 NEXT line
  340 ENDPROC
  350 :
  360 DEFPROCchars
  370 ?&368=&13
  380 VDU23,48,28,34,65,65,65,65,34,28
  390 VDU23,49,8,24,8,8,8,8,8,8
  400 VDU23,50,126,1,1,62,64,64,64,127
  410 VDU23,51,62,65,1,14,1,1,65,62
  420 VDU23,52,6,10,18,34,66,255,2,2
  430 VDU23,53,127,64,64,126,1,1,65,62
  440 VDU23,54,62,65,64,126,65,65,65,62
  450 VDU23,55,127,66,4,8,16,32,32,32
  460 VDU23,56,62,65,65,62,65,65,65,62
  470 VDU23,57,62,65,65,63,1,1,65,62
  480 VDU23,224,255,255,255,255,255,255,
255,255
  490 VDU23,225,24,24,24,255,255,24,24,2
4
  500 VDU23,226,0,0,0,255,255,0,0,0
  510 VDU23,227,0,198,108,56,56,108,198,
0
```

Turn to Page 116 ▶

Get it right ✓

```
                                210 = 53D2 A    330 = CAF3 3    450 = 9B0E 6
                                220 = 4E21 4    340 = ED0F D    460 = E8DE 7
 10 =     0 0   110 = 8728 4    230 = A5F7 3    350 = 9719 3    470 = 563F 8
 20 =     0 0   120 =  F1A 6    240 = 9A30 D    360 = 1613 3    480 = FED3 8
 30 =     0 0   130 = 379C 3    250 = C9EF E    370 = ABC9 F    490 = 6F5B 3
 40 = 8B0B B    140 = 5739 4    260 = 9228 5    380 =  ADF 2    500 = 7492 6
 50 = A3FA C    150 = 72A7 E    270 = 3B4C 4    390 = 2B40 9    510 = 3647 7
 60 = 4F45 7    160 = D96A C    280 = ED0F 3    400 = 5B49 B    520 = E97F 3
 70 = AA55 3    170 = D435 5    290 = 9719 8    410 = B347 7    530 =  F64 D
 80 = 2F13 5    180 = 6F38 C    300 = 411A 2    420 = 5865 9    540 = ED0F 5
 90 = E9D1 F    190 = 6AD6 7    310 = 39E5 B    430 = B826 0    541 = 9719 4
100 = 9719 F    200 = 99F3 9    320 = D988 1    440 = 5ABF 2    542 = 27DB 4
```

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Upgrade uses space

I RECENTLY upgraded my BBC B to disc – I am using the Acorn DFS – and every time I try to load my tape version of Soccer Boss by Incentive Software at the end of loading the micro crashes with the message *No room at line 34*. What should I do? – **Paul Smith, Hartlepool, Cleveland.**

● *When you get a disc upgrade some of the micro's memory is reserved for looking after the disc, so there is less room for your programs. You can recover this extra room by typing:*

```
PAGE=&E00
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before you load your tape.

Fitting ARM 3

I AM planning to obtain an A3000 with a colour monitor and understand that while an A410 is upgradable to use the ARM 3 CPU interface board the A3000 is not.

Is it technically feasible to use an ARM3 CPU interface board for an A3000 to speed it up to 10 MIPS plus, either in future or today?

I would like to upgrade the A3000 system to 2 Mbyte by adding extra memory chips. What kind does it require and how do I configure the system?

Finally, which is the fastest PC emulator, and is it technically feasible to emulate IBM 8MHz AT speed? – **R.G. Payne, London S7.**

● *The problem of upgrading an ARM 3 CPU is its physical size – it has many more pins than the original chip and simply will not fit. Also, the original flat pack is not the easiest thing in the world to remove.*

Adding extra memory to an A3000 system is not simply a matter of plugging extra chips in, as they come on a small backing board – see the advertisements in this issue for upgrade details. The system itself will detect this extra memory when it is installed. Finally, it is not possible to match the speed of an 8MHz IBM AT because, powerful as the Risc chip is, it is only running at about 8MHz itself.

It also loses time looking after the screen display so most real IBMs will run faster.

Anyway, the PC emulator is not meant to be used seriously – but as an argument against uninformed people who hold the purse strings to let those who know better get the best machine.

No one in his right mind would want to use a PC when he has an Archimedes.

Topics on the agenda...

- ***No room for games***
- ***Expanding an Archimedes A300***
- ***Using an old printer***
- ***Cracked keyboard***
- ***A dimming idea***
- ***Wrong side catalogued***
- ***Micros in control of the environment***
- ***Cassette loading problems***

Terminal printing

I HAVE recently obtained a Perkin-Elmer 655 terminal which has a RS232-C serial interface and I would like to be able to use it as a printer from my BBC Micro.

I know it works, as I have produced the self test from it, but is it possible to use it from my BBC Micro? If so, what connections must I make, what baud rate do I use and how do I set the four DIP switches marked Busy polarity, Time out, and the two for Self test? It would be great to get it to work. – **A. Brown, Rushden, Northants.**

● *You need to find out what baud rate your terminal runs at – if it is fixed it is likely to be either 300 or 2200 baud. Set your micro to this – using *FX8,3 or 4 – and tell the micro to use the serial port with *FX5,2.*

Then make up a cable as described in the User Guide. The Busy polarity switch controls which way up to accept the busy signal and without a manual you will just have to try each way.

The timeout switch will only turn the printer off if it has not received anything for any fixed time.

Faulty keyboard

I HAVE a BBC B issue 7 with extreme keyboard problems. The keys on the bottom row from Z to / and also Tab, Copy and the spacebar don't work alone. However if I press one from the above row the lower one will function.

For example, if I press the spacebar nothing happens, but if I press the D with it a space comes up. The keys work with most of my games but not Hypersports.

I have Watford DFS and AMX ART fitted to my machine and I am getting desperate to get it working properly as my mum and dad are wanting me to teach them how to use a word processor.

Please could you tell me if I will be able to fix this myself or if I will have to have it repaired by a dealer? – **Daniel Wood, Burnham-on-Crouch, Essex**

● *This is a very simple fault to cure but unfortunately it is a little tricky to track down. What has probably happened is that there is a crack in the printed circuit board of the keyboard.*

It is most likely to be a hairline crack at the point where one of the keys is soldered to the board.

You need to remove the keyboard and test the continuity from one key to the next with a meter – take any key that is malfunctioning and see where the copper track goes, then test that there is a connection with the meter. If you haven't got a meter you can make do with a battery and

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bulb. The most likely place for a fault to occur is near the Z and X keys, which are used a lot in games – repeated heavy use flexes the PCB and can cause a crack. When you have located the offending track simply solder a piece of wire between the two switches.

In the spotlight

I AM an A level student taking a design course and my last and biggest project is to computerise a drama studio.

This involves putting the control of all the theatre lights under a BBC Micro – or an A3000 if I can sell the 8 bit machine.

The setup they have now is 24 dimmers under control of a 24 channel manual slider desk – Rank Strand Trempus. Each dimmer works on the 0-10 volt scale so if I can make 24 micro-controlled dimmers – to control the big ones – it should be no problem.

I thought I could use D/A converters at first and that four bits from the user port would do for one channel.

But as this will probably not give very smooth dimming I thought I would have to use all the eight bits in the user port.

This will enable me to make only one A/D so I will have to use multiplexing and that means for all 24 dimmers I will need 192 channels.

What are your thoughts on this project? Am I going at it the right way? – **Mike Lakin, Bilston, West Midlands.**

● *First of all make sure that you just need 10 volts to control the dimmer rather than the potential divider action of the existing sliders.*

You will probably need to go to an 8 bit controller to get the smoothness of dimming especially as most commercial systems are not very linear.

As you say, the first problem is getting the bits out of your micro. The cheapest solution is to connect all 24 D/A converters to the 1MHz bus.

This would allow you to use relatively inexpensive ZN425E8 devices but using 24 would bring the cost of these alone to more than £130.

Each device could be addressed by one of three 74LS42 decoders which in turn would be connected to a master decoder.

The general way of going about this was shown in the sound sampler article in the January 1986 issue of The Micro User.

An alternative would be to connect all the D/As to the user port and then use the printer port to activate the one you want to write to. Note that the user port will need buffering with something like a 74LS244 if it is to drive 24 chips.

However, most D/A converters only give about 2.5 volts so then you will have to use operational amplifiers to get up to 10 volts.

Note carefully how much excess voltage your dimmer system can take as you would not want to damage it and this will require a separate mains power supply.

Finally one trouble with theatre dimmers is that they generate a lot of interference – both air and mains-born.

This has a habit of getting back into your micro and making it crash. Therefore you will almost certainly need to screen the micro and add extra mains filtering on the input.

If this does not work you will have to place opto isolators in the system to make sure that your micro is not directly connected to the D/A circuitry.

All in all, a rather ambitious and expensive project. I think that just getting one channel going would be adequate for the purposes of your project.

Hidden second side

I HAVE a BBC B with a single, double-sided disc drive but a fault has developed and I am now unable to access side 2. If I catalogue it I get the heading for drive 2 but the contents of drive 0.

I would be grateful if you could tell me if this is a micro fault or disc drive fault so that I can arrange to have whichever it is repaired. – **J. A. Meitiner, Etchingham, East Sussex.**

● *The fact that the DFS thinks it is accessing drive 2 means all the signals are probably correct as they exit the disc controller. But as the drive then gives you the catalogue drive 0, it suggests that the side select signal is not getting through.*

This could possibly be a fault in the cable or one of the connectors – try re-seating them first in case one has come loose – and if you have access to some test equipment, check that the SIDE signal on the edge connector of the disc drive is actually changing. If it is, there is a fault with the drive itself, but if not, it is either what I have mentioned above or the logic gate driving the line inside the micro – IC79 – or link PL3 that has become unattached.

Greenhouse effect

I USE my BBC Micro to control a stable environment for my greenhouse: The problem is that if the temperature gets too high the plants dry out and wilt as water is evaporating but if the temperature does not rise the plants get waterlogged.

I also use my micro to measure the humidity and temperature and save the data to disc for plotting out later.

It is possible wish to replace the micro with a single board 6502 micro but keep my basic program and disc filing system?

Is it possible? Having asked a programmer this I was told that I should learn C as it is transportable, but I would also have to know how the OS and DFS work to achieve my objective. – **B Rouse, Cheltenham, Glos.**

● *Most single board 6502 micros would not be sufficient to retain your high level language approach be it Basic or C, nor would it allow you to have disc access which is what you require.*

To use this type of board you would have to add a disc interface and write all the sofware, including the disc contoller routines, in machine code that you would place in rom.

A much better solution would be to use the board developed by Control Universal, 137 Ditton Walk, Cambridge (0223 244447).

The firm has a series of BBC Micro compatible stand-alone boards that would allow you to make a dedicated system using something very close to your existing software.

Tape troubles

I ENJOY typing in listings and getting them to run successfully and now have a collection of about 50 programs which include many I have bought.

Recently I have experienced difficulty in getting all but five to load, no matter how I adjust the volume control on my cassette recorder. Some listings start to appear on the screen and after a while it tells you to rewind. On other tapes nothing at all appears. Can you please tell me where the probable fault lies – the micro, the TV monitor or the cassette recorder? By the way, I have recently moved from the Midlands to Cornwall, could this in any way effect the running? – **A.S. Dodgson, Stratton, Bude, Cornwall.**

● *First of all you can rule out your TV monitor or the area in which you live. As you can get some listings to load then it would seem unlikely that your micro is at fault. This leaves only two possibilities, the cassette recorder or the tapes themselves.*

It is possible that in your recent move your recorder suffered a knock which moved the head out of alignment. You can adjust this with a small screw located next to the head.

To do this play a tape while listening to it, adjust the screw until the sound is bright and clear and not muddy.

The other possibility is that your tapes have become damaged, perhaps by being in close proximity to a magnet in a loudspeaker. Again the way to tell this is to listen to the tape while it is loading. Any damage will be heard as blips amd clicks .

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The Minitel

Kate McGill's eyes are opened by a French online database, accessed from the comfort of her armchair

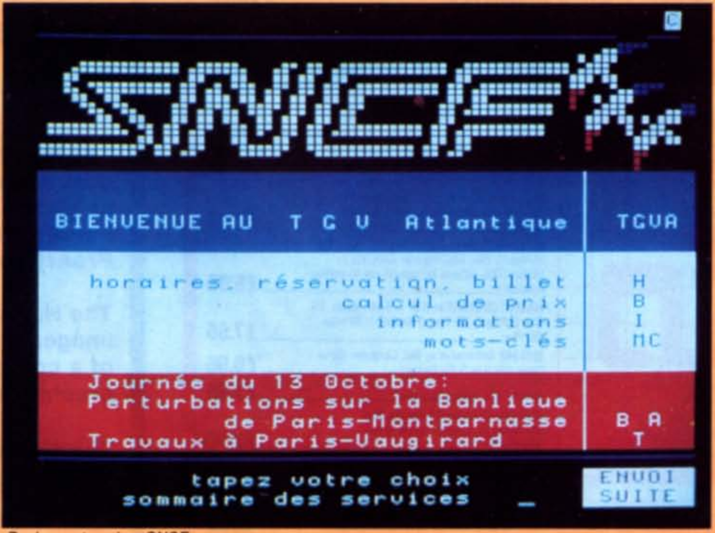
BIG is often synonymous with American, but there's one area in which the USA doesn't compete in size with a particular European country. That area is data communications and the country is France. Its Télétel videotext system, usually known by the name of the dedicated terminal it uses – Minitel – is the most successful online experiment ever.

Minitel dwarfs any other system of data communications anywhere in the world. If Minitel were suddenly to lose a number of subscribers equal to the combined userbases of MicroLink, Telecom Gold and Prestel, it would hardly dent the tank. And if you add together all the services provided by those three major UK systems, they amount to a small fraction of the range available on Minitel.

Minitel offers hundreds of business services, messaging systems, bulletin boards and chatlines – some of them overstepping the bounds of French, let alone British, decency – a comprehensive index of services in French and English with easy to use search facilities and, of course, the online telephone directory with which it all began.

The concomitant of all this is that you can ask almost any French person about online communications and he or she will have a point of view – good value for money, too expensive; not used enough, over-used; educational, merely a technological toy which occasionally has its uses. Ask the same question of the proverbial man in the UK street and expect a stare of utter incomprehension.

With more than 12,000 separate services, over five million regular users and close on 100 million connect-hours a year you can be pretty sure that the quality and range of services – and the undoubted increased efficiency of the many people who use them – are enough to squash any sour grapes which might otherwise be harvested by those who run UK online systems. The proof is that at the time of writing British Telecom itself is running trials on Minitel as an information provider – ironical since Minitel was based on technology developed in this country for Prestel. It's the hovercraft story all over again.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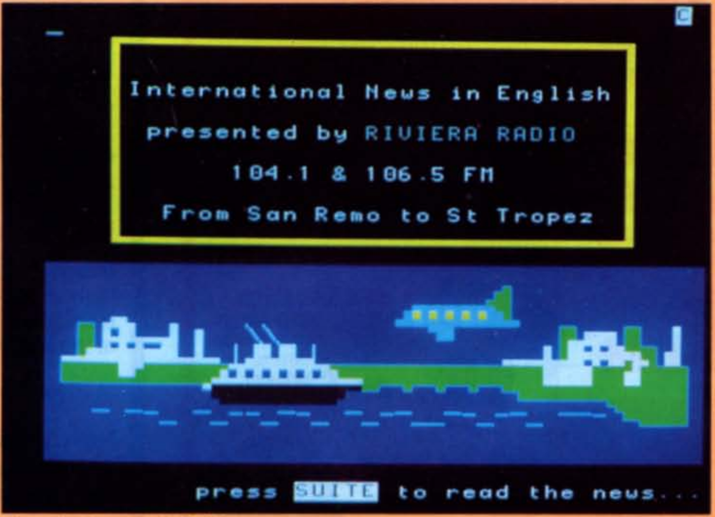
```
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```

Accessing the news – in English

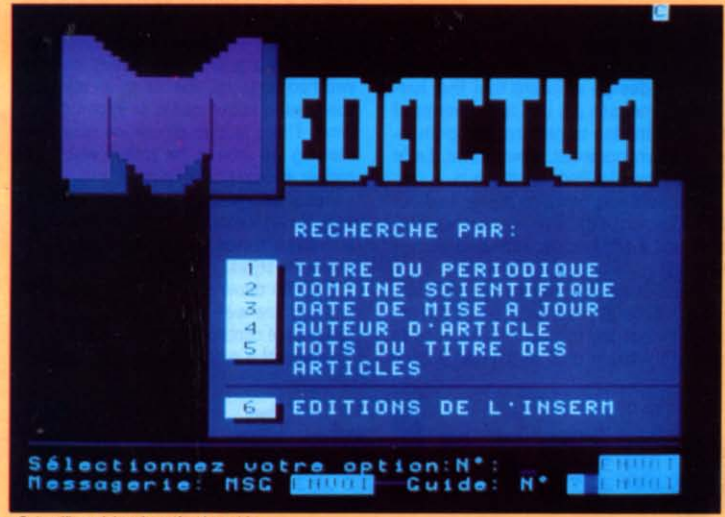
There for the taking

There's an increasingly important international side to Minitel in the guise of MinitelNet, France Télécom's aggressive and very serious attempt to extend its success to other countries, and thereby to impose its standards by the sheer force of numbers. In May 1989 the first MinitelNet access point was opened in Tokyo. There's still no official estimate of usage, but the fact that services in Japanese are fast appearing on Minitel gives an idea of how seriously the French are taking this link.

It's much the same story in Austria, Spain, Switzerland, Germany, Luxembourg and the USA, where the first experimental Minitel service was in Houston.

This service has attracted 12,000 users who are clocking up a very respectable 36,000 connect hours a month, and other gateways have now been set up in Nebraska, Washington, Philadelphia and New York. Expect an American Minitel

experience



RECHERCHE PAR:

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2 DOMAINE SCIENTIFIQUE
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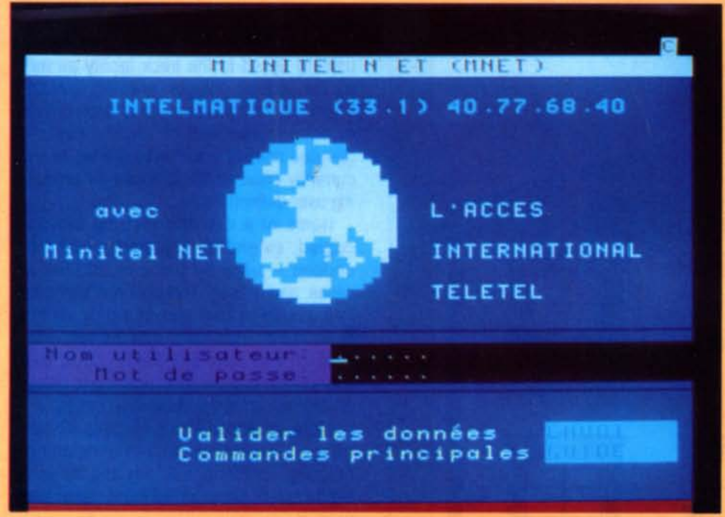
Scientific articles there for the taking



INTELMATIQUE (33.1) 40.77.68.40

avec Minitel NET L'ACCES INTERNATIONAL TELETEL

Nom utilisateur: ......
Mot de passe: ......

Valider les données
Commandes principales

Logging on to MinitelNet

explosion in the near future.

MinitelNet has been available in the UK for a while, but so far has not attracted the attention it deserves. I have no plausible explanation for this and there certainly need be little language problem, since there are numerous services in English, and schoolboy French will get you by on many that are not translated.

Direct access to Minitel from the UK is via a server in Paris, while MinitelNet itself is accessed via British Telecom's PSS or Mercury's Packaged Data Network. The total cost of connection, including the surcharge for the particular service used, can be as little as £9 an hour. If that sounds a lot, remember that an hour online is a very long time indeed.

Time on MinitelNet is sold in blocks of connect units on the same principle as phone cards. Each unit is worth 30 pence of connect time. So £30 buys 100 units, and and this gives you over three hours of connection on the lowest service charge band and proportionately less in the higher bands – there are seven in all.

Some, such as those containing databases likely to be accessed for very short periods by corporate organisations, are very expensive. News and business services tend to work out at about £15 an hour – cheap information for British businesses looking to exploit France as a market. There's a great deal to see and use in the lower charge bands. Most educational and general services, for instance, are in the lowest band of all, providing the perfect opportunity for schools and places of higher education to explore France, its culture and thinking, without queuing up at Dover. Not to mention the benefit to those studying French as a foreign language – there's nothing quite like giving students interactive projects on a real-time French system.

Summing up

There's lots of useful information on Minitel and it's there for the taking. The software is a little pricy but is probably worth the money just for the expérience.

The agent for selling connect time in the UK on behalf of France Télécom is Aldoda International, a London-based telecommunications company which also supplies the necessary emulation software.

This is a complete Minitel comms package which not only allows a BBC Micro to display the special block graphics – they are not quite the same as Prestel's graphics – but also sets up the keyboard to send the same codes as the dedicated keys on a real Minitel terminal. The result is that there's little difference between using a BBC Micro in the UK and the real thing found in almost all French homes and offices.

The software includes fully automated logon procedures, and simple routines for capturing and downloading screens to disc or printer. It comes with full documentation, and if bought together with a subscription to MinitelNet, a detailed guide in English to the major Minitel services is also supplied.

It has to be said that at £28.50 the software is not an outstanding bargain, particularly in view of the fact that many people who may wish to buy it will already have a modem, and therefore communications software, and will thus have no need for a new program except to access Minitel. On the other hand, this is an investment which in my view is worth every penny. You often see references in English documentation about Minitel to "The Minitel experience".

Events have caught up with that linguistic mistake – Minitel is now genuinely an experience, and one not to be missed.

MinitelNet contact:
Aldoda International
27 Elizabeth Mews
London
NW3 4UH
Tel: 01 586 5686

CAD encapsulated

Steve Bruntlett gets to grips with a sprocket generator

Product: LinCAD Archimedes
Price: £150
Supplier: Linear Graphics Ltd, Unit 39, Mochdre Industrial Estate, Newtown, Powys SY16 4LE
Tel: 0686 629292

LINCAD Archimedes is claimed by the makers to be an advanced 2D draughting and design software tool that harnesses the unrivalled power of the Archimedes to perform comprehensive, often complex, operations. Let's look at how justified this claim is.

The package contains a well laid out 260 page, ring-bound A4 manual, a single disc and a rather nice laminated orange keystrip.

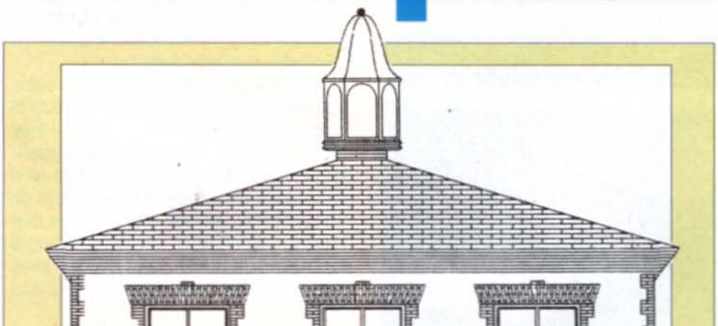
The normal backup commands are used. I made a further backup and deleted the files that the manual recommends to create a working data disc. I had a lot of problems with this working disc, but more of that later.

A copyright message and licence agreement are displayed before the screen clears to reveal the working area. The top line of the display has drop-down menus for File, Edit-Block, Create, Edit-Item, Assist and Utilities. The bottom line shows details of the current operation and the coordinate position of the cursor.

The rest of the screen is workspace and starts with a grid of dots which may be switched on or off and set to a variety of spacings in either metric or imperial systems. There is also an outline rectangle showing the area of the screen which will appear when printed or plotted.

Features include the creation of lines, arcs, circles, boxes, polygons, ellipses, text and spline curves in 16 colours and 7 different line styles.

The line drawing and general geometric facilities are well implemented. Cubic B-Splines are continuous curves drawn along the route of a rubberbanded line and may be rearranged by the use of control points.



Repeated designs like windows are easy using the copy feature

The spline system works well and is usefully linked to the track facility as well as the regular polygon drawing system. The track facility allows you to draw outline or solid tracks with or without fillets – rounded corners – following splines or the currently selected file template for producing user-defined tracks.

Items of a drawing may be moved, copied, extended, adjusted, erased or undone – piece by piece or, in special cases, part erased. This option is less than impressive in that you can only delete items in turn from the end of the sequence in which they were produced. It could take a long time on a complex drawing to delete an item drawn at the beginning.

More advanced Block features include rotating, rescaling, auto-dimensioning, hatching, mirroring, tracking and fabricating arrays of items for wall and panel sections, for example.

Linear Graphics claims that a unique feature of this package is its ability to produce drawings with rotational symmetry, like cogs and wheels, very easily.

These are achieved by using a template, which is a drawn object such as a cog tooth or user-defined track symbols, with a tracked regular polygon. The system works well as long as the template is not too complex. As far as I can tell, the procedure can't be aborted if its not going right or is taking too long.

I had problems in trying to use the file template – the machine locked up completely when I tried to use one of the existing file templates supplied on disc to produce a regular polygon with distorted track. It also locked up when I tried to use the undo feature on one occasion.

I have the feeling that the version I had for review wasn't quite as finished and as bug-free as it might have been. I tried the program on a standard Archimedes 310 and a 2 megabyte A3000 just to check that it wasn't a problem with one machine. It wasn't.

The distort facility allows drawings to be transformed isometrically, axonometrically or in perspective. The first two projections can be produced automatically using the Polar Point option on the function keys.

Text may be produced in several different ways, one of which enables it to follow arcs and lines. This is a powerful option and can utilise either of the fonts in a fixed size, the proportion of which may also be altered, or one that adjusts itself to fit the line or arc exactly.

LinCAD Archimedes allows immediate access to a wide range of function key menus during any create or edit operation without disturbing the current activity on the working area. These functions include changing the parameters affecting the design grid, line style, colour, hatching pitch and angle, track width, fillet radius, unit system, unit scaling and magnification.

These work very well and create a very user friendly working environment. They are also accessible at all stages of the drawing procedure. The coordinates of points may also be entered directly at the keyboard making use of absolute, relative or polar positioning. These are useful for two point perspective work and isometric and axonometric projection.

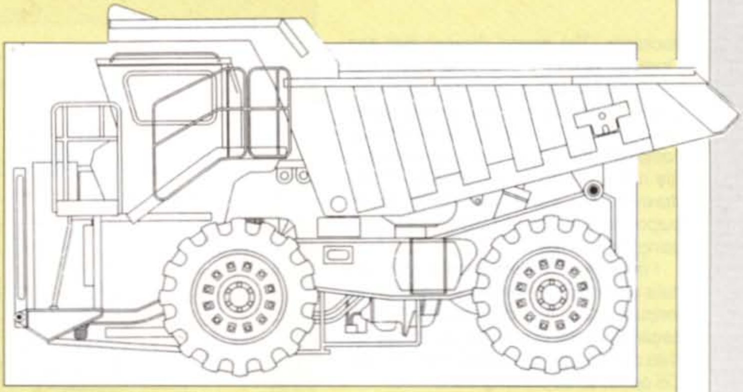
The mouse is the normal way of inputting data but, as in an increasing number of graphics and CAD packages, a graphics tablet – such as the Genius GT-1212 or Archi Graphics Tablet from Watford Electronics – may be used instead allowing data to be entered by puck and tablet.

The program can output through parallel and serial ports to Plotmate, Graphtec and HGPL language plotters, Deskjet and Paintjet printers as well as Epson FX and LQ compatible printers. The printouts accompanying this review were printed on a Star LC24-10 and are of excellent quality.

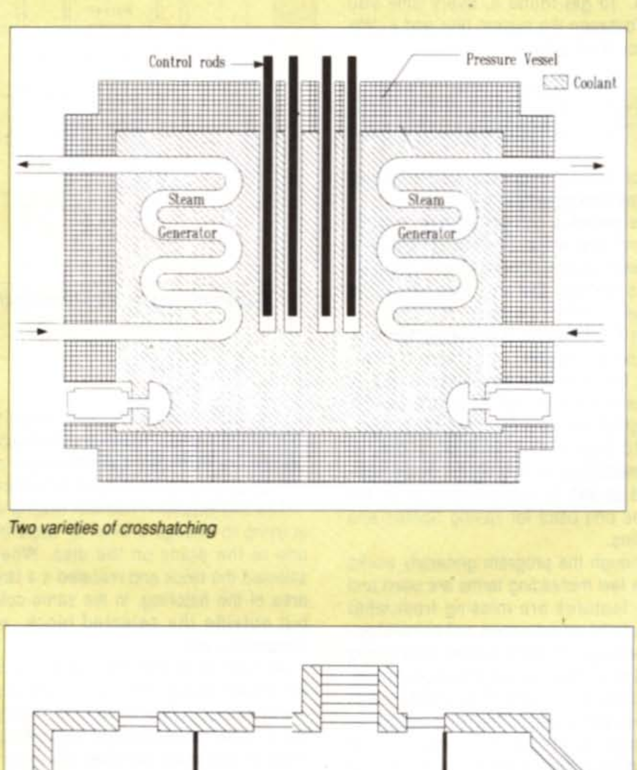
One nice touch in the program is being able to put an information block at the base of the drawing. However, you can only type in your name and your place of work, which might be a bit limited. If you type to the end of the command line – which I did just to see what happened – and press Return you lose all the menu names on the top information line and the coordinate references on the bottom command line. The screen is redrawn and the top and bottom lines turn dark blue, but thankfully the menus still work.

Drawings can be saved as normal drawing files, as DXF format files, as Drawfiles for DTP applications or as part or full screen sprites for inclusion in graphics

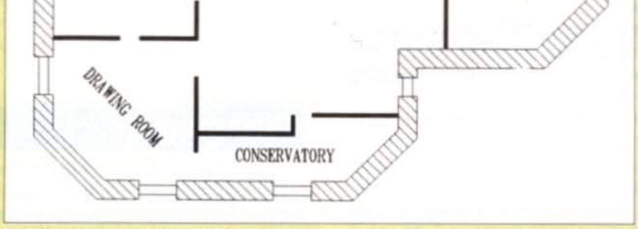
➤



Wheels produced by rotational symmetry



Two varieties of crosshatching



Text can be printed at any angle

➤

packages. The normal drawing files and Drawfiles worked perfectly well, but I had no success in saving drawings as sprites. I just kept getting prompts asking me to select a start point for the sprite after I'd completed the sprite block and entered a file name. I would have liked to import drawings into Pro-Artisan for rendering purposes, as I suspect would other people using this package.

I did have a few problems in using the data disc which I referred to earlier. The instructions on the addenda sheet at the beginning of the manual tell you to use the data disc by typing *0:LinCAD* from the Risc OS option under the filing menu.

If you do this, as I did, you'll have all sorts of problems with operating system errors. To get round it, every time you swap between the system disc and a data disc you have to type:

```
MOUNT
0:LinCAD
DIR LINCAD
```

at each prompt to get the filing and help systems working properly.

This seems a convoluted way of working, and one which I feel is serious flaw and needs putting right by Linear Graphics. This is perhaps the only area where the manual is far from clear and unhelpful.

The Help system is implemented very well and is available at all stages of drawing in the form of a Help main menu as well as help for all options when they are highlighted with the cursor and the function key f10 is pressed. This loads in specific help messages for the option being highlighted as well as sub-menus such as the Utilities one used for saving Sprites and DXF files.

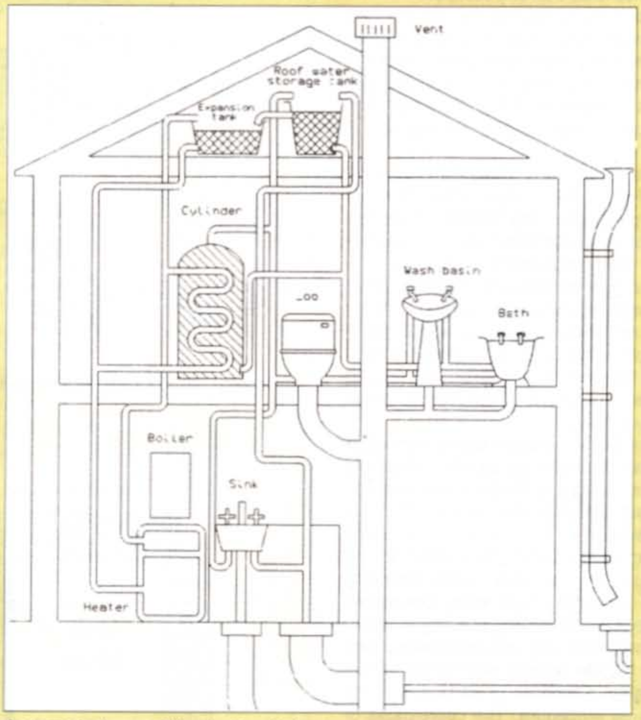
Although the program generally works well, a few misleading terms are used and some features are missing from what claims to be an advanced and comprehensive package. There is no real PAN facility provided to allow you to move your drawing across the screen. Presumably this is because the screen is fixed to represent an A3 page, but it would be nice to pan around the screen without having to move the drawing manually.

Moving a drawing around the screen can take a long time, as the entire drawing has to be undrawn line by line and then redrawn.

The so-called PAN facility employed in the program merely undoes the selected degree of zoom, which is very misleading use of the term.

A minor criticism of an otherwise competent CAD program is that scaling is carried out visually. Boxes are used to scale parts of the drawing, and while this is useful in allowing parts of a drawing to be scaled into a given space, it is no use if you want to reduce the drawing by a given proportion or percentage.

As far as I can see there is no way of scaling numerically, unless you count the dots on the grid. However, the scaling options are extremely comprehensive and include automatic rescaling of dimensions.



A schematic diagram of the plumbing of a house

The only problem I had with scaling was in trying to enlarge a block of steps from one of the plans on the disc. When I selected the block and rescaled it a larger area of the hatching, in the same colour but outside the selected block, was rescaled as well.

As there is no undo for operations, only for drawn items, this ruined the work, which on this occasion was not important but at other times could be very serious. I tried it again on another drawing on another machine but the problem persisted.

The drawings provided on the program disc are excellent and clearly demonstrate the package's power. If only its problems could be sorted out Linear Graphics would have a good CAD package on their hands.

Summing up

In reply to Linear Graphics' claim quoted at the beginning of the review, I would say that LinCAD Archimedes is comprehensive, but I wouldn't say it was advanced. Also, the package is rather expensive for a standard CAD package.

VIEW II

While it certainly has lots of very clever features, LinCAD Archimedes is another of a recent stream of products converted almost directly from some other micro – often the PC and usually by re-compiling the C source code. This means that you get a package that doesn't use Windows, doesn't use standard menus, doesn't use the mouse standardly and doesn't multitask.

The whole idea of the multi-tasking Desktop environment is to provide a standard user interface so that you don't have to trouble with the little quirks of each new piece of software you buy – if every one behaves in the same way it's easy to learn.

There are bonuses from the programmer's viewpoint too: All the loading, saving and diagram drawing routines, printer drivers and so on already exist in Acorn's C compiler version 3, so all that work is avoided.

Any software that doesn't obey Acorn's rules is automatically on to a loser. When you want to buy software for your Archimedes the first thing to ask is: Does it multi-task. If not, think twice before you buy.

Steve Turnbull

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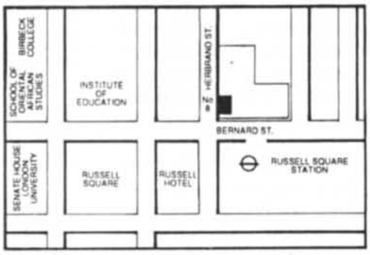

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Plusses for Wordwise

Rob Barnes introduces a useful disc manager for this popular word processing program

THE versatile programming power of Wordwise Plus is ideal for refining day to day writing. Other word processing software may be more sophisticated, but Wordwise Plus documents can be manipulated directly and quickly. However, the file management leaves a lot to be desired, so here are two segment programs to help.

The routines are designed to index Wordwise files on disc and speed up saving them, but the indexer works just as well with Basic and other types of file. It creates a Wordwise document of the relevent files together with a line of text for each. This index is automatically saved to the disc and can be printed if required.

The second program is a relatively fail-safe way of saving files. It picks up a filename automatically from the text and uses it. On the Master it also types in the date and time of saving. I'll give details for other 8 bit BBC Micros later.

Memory locations have been provided by Paul Beverley of Norwich Computer Services and all the programs need are two REM statements at the top of the text. These are entered after the usual f1 green embedded command.

The first must include the words THIS FILE IS CALLED – in upper case – followed by one space and the filename. The second REM is followed by ^ and a reminder of the file's contents. Both must be towards the top of the text.

A typical set of codes is shown below. Each begins with the usual f1 green embedded start command and ends with a Return instead of the f2 end command:

```
EP
LM9
LL67
JO
PL72
REM THIS FILE IS CALLED FILE1
REM^ File about indexing and saving
OC27,40
```

An additional advantage of these REMs is that there is always a reminder of the filename and contents as part of each file – a great help if you ever need to recover them from a damaged or corrupted disc.

To use the indexing program, key in Listing I and save it as INDEXIT or any other name you wish except INDEX. Load it into segment 9 and run it by holding down Shift and pressing f9. The disc you want to index must either have an existing file called INDEX or room for one to be created. You will then be prompted for a number and name for your disc. Without these the printouts of each index would have no means of identification. The program then scans the disc and creates the file INDEX in the main text area and automatically saves it. This can be loaded and printed at any time you wish.

It works by searching the disc for a ^ character towards the top of each file and picking up the line of text which immediately follows it – this is why it will work with any file type. The line is then automatically entered into the main text area of Wordwise Plus and once the whole disc has been checked it is saved as the file

Hardware differences

The listings given here in the SAVE program are for the Master and make use of its internal clock. For the BBC B and BBC B+ omit the lines PRO.time, PRO.put, PRO.type and the sections of program beginning .time, .put, and .type.

Also change the line which says:

```
"  AT "+K$+E$+"   SAVING
```

to:

```
        P."SAVING   "+G$.
```

You may also wish to change the OC27,40 printer code in the INDEXIT program to suit your own printer.

Listing I

```
REM  *** INDEXIT ****
REM  By Rob Barnes
REM  (c) The Micro User
CLS
S.TE.
DE.TE.
TY."|GEP|R"
TY."|GTS3|R"
TY."|GFP20|R"
TY."|GLNS|R"
TY."|GLM9|R"
TY."|GLL67|R"
TY."|GLS1|R"
TY."|GJO|R"
TY."|GBS7|R"
TY."|GDT3|R"
TY."|GREM THIS FILE IS CALLED INDEX|R"
TY."|GREM^ Index Data for a printout|R"
TY."|GOC27,40|R"
TY."          INDEX for Disc @|R|R"
C.T.
FI."@"
C.R.
DE.L.
CLS
V.31,6,8
P.
D.
V.131,141
P."DISC Number?"
T.2
P.
P."  TYPE THE NUMBER - Press RETURN"
P.
B$=GLK$
TY.B$+" "
P.
P."  TYPE THE NAME OF THE DISC"
P.
N$=GLK$
TY.N$
SE.SEG.8
DE.TE.
CLS
V.31,6,8
P.
V.136
P."PRESS ANY KEY TO START"
P.
P."N.B."
P.
P."Will not work on a full disc unless"
```

called INDEX. Any files on the disc which do not have a ^ character within the first 490 characters at the top of the text cause the line:

```
** No Data on this file **
```

to be entered into the index.

The !Boot file is ignored – the relevent procedure can easily be spotted in the listing and can be extended to leave out other ones by repeating it.

Listing II – the SAVE program – may look a little long for a segment program, but it gives you a time check on the Master and automatically enters the time and date at the top of the text so you know how old the file is when next you load it. Once the listing has been keyed in and saved it can be loaded into segment 2 – the !Boot file is a good way to do this – and operated at any time by holding down Shift and pressing f2.

It works by finding the string THIS FILE IS CALLED and moving the cursor to the end of this line where the next word – your filename – is picked up. There is an error trap in case you forget to use a filename or use more than seven letters.

Next the memory locations for date and time are called and the time string adapted for the 12 hour clock display on screen. These time strings are stored in K$, L$ for the 12 hour screen display and M$ for the full string typed into the text.

This replaces any previous string already there. The familiar Replace Old File? Y/N and File not saved! traps are still part of the program.

You should note that, as with any segment program, if these routines are interrupted they sometimes return the error Can't execute. Previewing anything in memory using option 7 on the Wordwise Plus Menu – without pressing Escape – will generally solve this problem.

```
P."you already have a file called INDEX"
P.
P."(Program deletes and resaves INDEX
file)"
A%=GE.
CLS
V.31,6,8
P.
D.
V.131,141
P."INSERT DISC YOU WANT TO INDEX"
T.2
P.
P."    THEN PRESS ANY KEY"
A%=GE.
CLS
A$=""
CLOSE#0
*ACCESS *.*
SA.TE."INDEX"
*DELETE "INDEX"
*CAT
*SAVE XXXXXXX FF7CA4 FF7FFF
DE.TE.
LOAD TEXT "XXXXXXX"
*DELETE "XXXXXXX"
K%=0
C.D.7
V.31,6,2
P.
PRO.makelist
C.T.
TY."XXXXX|R"
C.T.
REPL."!BOOT",""
C.T.
R.
REPL."|R|R","|R"
U.EOT
PRO.findit
CLOSE#0
S.TE.
C.T.
SA.TE."INDEX"
CLS
V.31,6,8
P."FINISHED - PRESS A KEY"
A%=GE.
DI.
END
.makelist
CLS
VDU10,10,13
P.
P."Making a file list ";
T$="      "
R.
REPL.T$,"|R"
U.EOT
C.T.
P."!";
R.
REPL." ","|R"
UNTIL EOT
P."!";
E.
.findit
S.SEG.8
C.T.
X%=1
R.
CLOSE#0
C.D.X%
V$=GLT$
I.LENV$<1TH.E.
C.U.
FK.3
F."|R"
C.R.
FK.3
FK.7
C.T.
CLOSE#0
V%=OPENIN V$
D$=""
Q%=1
R.
Q%=Q%+1
D$=GCF$#V%
I.EOF#V%TH.D$="^"
I.D$="^"THEN Q%=500
U.Q%>490
L$=GLF$#V%
I.Q%<500TH.L$=" ** No DATA in this file!
**"
S.TE.
C.B.
TY."FILE CALLED:  "+V$+"|RCONTENT:
"+L$+"|R|R"
DI.
CLOSE#0
S.SEG.8
C.T.
U.LENV$<1
E.
```

Listing II

```
REM ** SAVE **
REM Rob Barnes
REM (c) The Micro User
D$="Y"
*FX220,0
C.T.
F."THIS FILE IS CALLED "
C.R.20
G$=GL.
I.LENG$<1ORLENG$>7TH.PRO.error
I.LENG$<1ORLENG$>7TH.END
J%=OPENIN G$
CLOSE#J%
CLS
PRO.time
I.J%<>0TH. PRO.prompt
I.D$<>"Y"TH.DI.
I.D$<>"Y"TH.END
PRO.put
P.
P."  AT "+K$+L$+"   SAVING  "+G$
SA.TE.G$
TIME=0
R.
U.TIME>200
DI.
*FX220,27
END
.prompt
V.31,6,10
P.
D.
V.131,141
P."Replace Old File?       Y/N"
T.2
*FX210,0
V.7
P.
P.
*FX15,1
D$=CHR$(GET AND 223)
I.D$="Y"TH.E.
I.D$<>"Y"TH. P."FILE NOT SAVED!    Press
ANY Key"
I.D$<>"Y"TH.A%=GET
E.
.time
K$=""
L$=""
M$=""
A%=14
B%=0
X%=&08
Y%=&04
Z%=&02
CALL &FFF1
X%=&418
Y%=&41A
Z%=&408
R.
K$=K$+CHR$?X%
X%=X%+1
U.X%=&41A
R.
L$=L$+CHR$?Y%
Y%=Y%+1
```

➤

All program listings in this issue can be downloaded FREE on...

MicroLink

```
➤
U.Y%=&41D
R.
M$=M$+CHR$?Z%
Z%=Z%+1
U.Z%=&41D
B%=VAL(K$)
I.B%>12TH.B%=B%-12
K$=STR$(B%)
V.31,6,4
P.
P."  THE TIME IS..."
P.
V.31,6,6
P.
D.
V.131,141
P.K$+L$
T.2
E.
.put
C.T.
FI."REM SAVED ON"
I.EOT TH.PRO.type
C.R.12
FK.3
C.AT 39
FK.3
FK.7
TY." "+M$
E.
.type
C.T.
FI."THIS FILE"
C.D.
C.AT
TY."|GREM SAVED ON|R"
C.UP
C.R.
E.
.error
CLS
V.31,6,8
V.136
P."FILENAME NOT CORRECT IN TEXT"
P.
P."      (MAX 7 LETTERS)   PRESS BREAK"
A%=GE.
E.
```

MICRO MEMORIES

Facts and tips you may have forgotten...or never known

TRACKING logical errors is often far more tricky than finding syntax ones as there's no error report. So which line printed that sprite in the wrong place? The following is a simple way to single step through your routine providing it's not too long.

- Define key 0 using:

```
*KEY0 REPEAT UNTIL GET|M
```

- Ensure your program is numbered in steps of 10 (RENUMBER 100,10 if necessary)
- Enter:

```
AUTO 105,10
```

- Hold down function key 0 until Z=GET is inserted between each of your program lines. Now when you run the program it will only move to the next of your own instructions if a key is pressed to pass the GET statement. If you enter TRACEON before running you can now see where you're up to quite easily. Pressing Escape at any time will reveal which line you are on.

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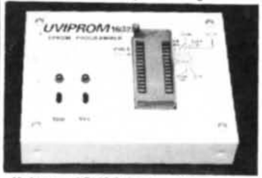

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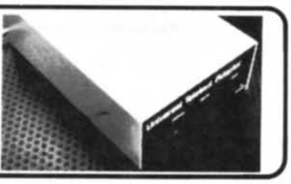

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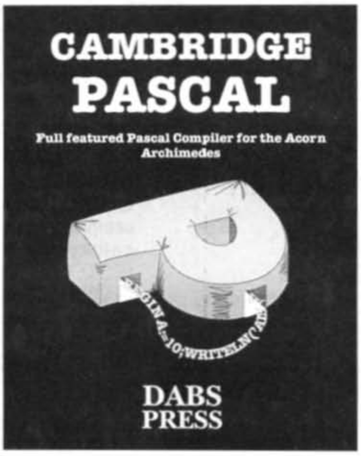

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Melting moments pave the way

The Mad Hatter continues his Viking exploration with a twist

YOUR main problem this month will be to decide where the legpull lies, or whether I am just trying to wind you up, as we continue our explorations into that lovely adventure *Erik the Viking*.

Shivering on the Iceberg Ledge, you are faced with icicles which are blocking the way north. I hope you have worked out that you need the kindling, driftwood and whetstone here, and that you should also be using suitable footwear.

Drop the driftwood and kindling then light a fire so that the icicles melt. I wonder how many adventurers tried shouting, hammering and the like here? I know I did. Now proceed N into the cold tunnel, N again to the frost cavern, N into the ice passage and W to enter the giant bedroom.

You should now go down into the cold cellar and take the plug – maelstroms for the use of – and return to the Golden Dragon by the shortest route so as to avoid a nasty death from drowning in icy water.

Your next destination is the rocky shore. Make sure you have the plug on deck ready for the maelstrom menace, together with the bear's sinews and the needle in case of a torn sail, and head S, S, W, S, W, W, W, W, W, W and finally N.

Climb up from the shore to the clifftop and go west twice to reach the Enchanter's Hall. Here Freya will inform you that Dad has left you something in his study before she vanishes. Being a refined type, I have to admit that I am partial to freyad fish and chips, but leaving that aside you should next press the tapestry to reveal an exit leading to the yellow room.

Now pay strict attention: You are in a maze – and *not* one of the types I did some teaching about a few months ago. Each room you enter has a political colour: If it is red, you move *right* out of the room; if it is blue, move *left* and if it is yellow move *back*. I wonder what Pete Austin would have dreamed up for a Green Room?

Anyway, enough of politics, it's time to grapple with the Enchanter's Study.

It is – as you might expect – a veritable treasure trove, once you have opened the cupboard. *Look* is the command which will reveal all the goodies.

There is some dust – well, you never know, you might need to throw it into someone's eyes – a scroll map of Greenland, a tough green bean (it's protein – which rhymes with green *and* bean), some spectacles – and who knows what they might reveal – a hollow tube and a puffed-up ragbag.

Last, but by no means least, is a lever. Pull it and you'll find yourself deposited back at the clifftop. If you then return to your ship you'll find a message from above – no, not written on tablets of stone, nor deposited by a seagull.

Help is offered by Al Kwasarmi: So, twice south, then west, five moves south again, west and three moves south will take you to the Stone Quay. Here you will find yourself at the start of not just a yellow-brick road but a golden one. And there you should patiently wait until next month.

● *Continued next month*

Hall of Fame

Thanks to David Shepherdson I now have solutions to **Ghost Town** and **Golden Voyage**.

Elite Hitman?

One reader, Commander Tealeaf, reckons his maximum rate of kills in **Elite** is 510 an hour. He says that the hour is measured from the time he enters an Anarchy system to the time he uses his escape capsule to go somewhere quiet and tot up his score. Can anyone better that? I'd like to see some form of independent verification if possible.

A puzzled Andrew Hardy wonders what on earth the *Right on Commander* accolade is supposed to do. Well, Andrew, it marks the fact that you have achieved 256 kills and it is the accumulation of kills that affects your combat rating. So although you are only *Dangerous* at the moment, plod on and you'll eventually gain top status.

Andrew also has a bit of a moan about mining lasers, saying that – for him – they damage an asteroid as much as a military one would and thus he has nothing to scoop up.

It's very important not to get too close to the asteroid you intend to exploit. Give it one very short burst from the laser, then follow it up a moment later with a second brief burst and that should do the trick.

It is for this reason that I always have my mining laser mounted on the left: I can then match speed with the asteroid fairly precisely at a reasonable distance before starting mining activities.

Andrew mentions a tip for accurate aiming of lasers for long distance combat: Target a missile, and when you hear the beep which indicates it is locked on, you know that your laser is also centred on the target ship.

David Waine is the first reader to offer a suggestion as to the identity of our old friend the Mystery Ship. Could it be a prototype of the target for Mission Four that exists in the 16 bit versions of Elite, he wonders?

This is a ship armed with a Cloaking Device, and the aim of the mission is to destroy it. If you then scoop up an ejected cargo canister the cloaking device is yours – and a very useful aid to duffing up Thargoids.

Now why didn't I think of that?

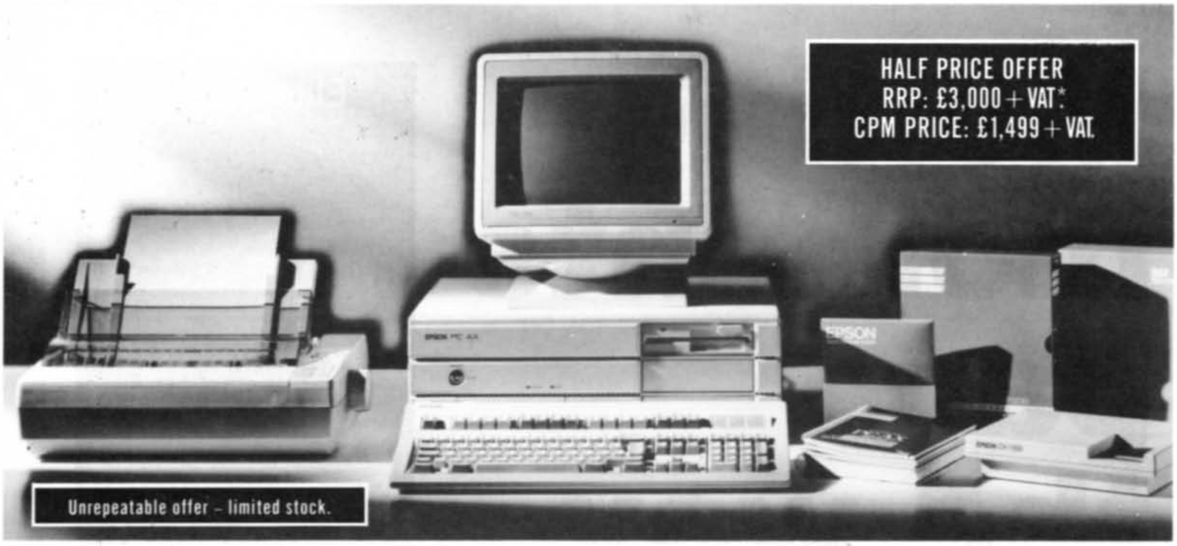
Uniform info

Belgian reader Willy Deconinck has written in with some information about the uniform that can be found inside the Desert King's castle in that marvellous adventure **Twin Kingdom Valley.**

I had stated a couple of years ago that I thought it was a red herring: Not so, Willy assures me, and this is what he has to say about it:

❛ The uniform allows you to enter the Desert King's castle via the desert instead of only having access to the castle

➤



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➤

by using the cave system near Watersmeet.

If you have created the crystal bridge with the wooden rod, then you can cross to the desert and so approach the castle.

If you are wearing the uniform, or carrying it outside the holdall, the Desert King's guards won't pull up the drawbridge in your face and so you can enter the castle and carry on your pillaging. ’

Willy adds that he still likes to play this adventure and has fun romping around the scenario, getting maximum treasure and weapons with minimum violence.

He says that it can be a fine old pickle when you've given the wooden rod to the giant, who in turn passes it on to a gorilla – who then makes the crystal bridge vanish.

Mrs. Sylvia Penton has some very helpful comments about the Rose Maze in **Programmers Revenge** which was featured in the October 1989 issue of *The Micro User*. She agrees it's fiendish but says there is method in Colin Jack's madness – which is what you'd expect – and she says that there is some sort of logical progression in the colours and sequence of the flowers. Sylvia offers the following short cuts, though she wonders if any other reader can better her solution. Here is what she has to say.

‘ *First, the sequence which leads you deeper and deeper into the maze is a pattern of flowers and the colours in which they are printed.*

It starts with red roses (the printing being in red) then green, yellow, blue, magenta, cyan and white. After this, the roses are combined with tulips while the sequence of the printing colours remains as before. The final combination before the Wasteland is roses (white print) and tulips (white print). ’

The route Sylvia offers starts at the fountain picture and is N into the rose garden, SE to the (yellow) roses, SW 15 times and then NE to the wasteland. To return from the Wasteland move S to the (white) roses and tulips, N 21 times to the rose garden and then W to the fountain. I am sure many readers will be grateful for this help.

Teacher's Turn

I have had a number of appreciative comments about my treatment of **L** a while ago, and many of the letters asked when I would be tackling another educational adventure. I recently acquired **Stig of the Dump** and I also bought **Giantkiller** for my younger son a while back – so, if it would be of interest I'll gladly arrange treatments of these.

If you'd like to see any other educational adventures featured in this column I'll be happy to oblige.

Problem Corner

RATING
000110
NOTHING
NOTHING
NOTHING

Spycat: Where is document Z?

Scott Kelly is having trouble with yet another adventure unknown to me, **Spellbinder** – so it's over to you readers for the answers to his questions.

How does he feed the eating plant? How and where should he use the telechange spell?

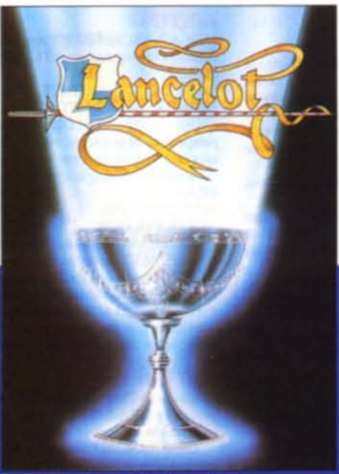
Stuart Burrows wants to know how to get Document Z in **Spycat** and how to stop dying after space-porting. Can anyone help?

One Melbourne House adventure I haven't got is **Dennis Through the Drinking Glass** and Ray Briddock is desperate for that first drink. Can someone help?

A Hall of Fame rating awaits the supplier of a full solution.

David Waine acquired an adventure called **Flight of the Unicorn** via Prestel some while ago – and wonders if anyone can help him get through the magic gates with an ear painted on them. Sounds as if a password is required. I hope he's tried *Open Sesame*.

Someone else stuck in **Adventure** is Peter Browning. He's got into the caverns, picked up the ingot and now wonders what to do next.



Search for the Grail in Lancelot

Hatter's Helpline

Scott Kelly has a **Hobbit** query: He's killed the dragon and got the ring, but can't find his way home through the forest – that's because he needs to try another route.

Have a good explore around the Laketown and River area, Scott, for the early locations and mind you don't forget to wear the ring.

He also wonders what use the boat is: It's simply a way across the enchanted river. Lastly he says he can't get Gandalf to open the Elvenking's magic doors. There's only one way through: Examine them, and then wait for elves to come – the door will then open and you can follow them through. Peter Browning has almost reached the end of that magnificent Mandarin/Level 9 epic **Lancelot** but is frustrated at the Antechapel. I am tempted to say the the solution is *elementary*.

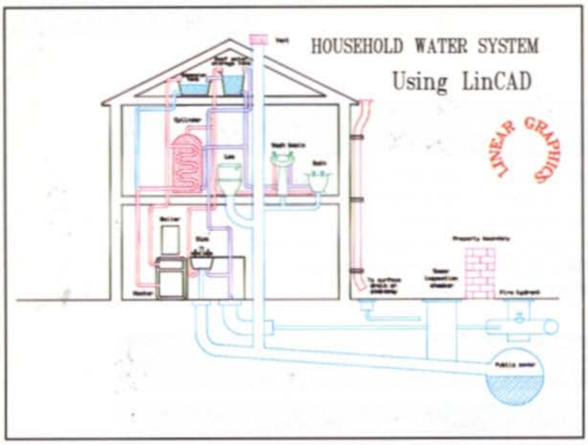
The secret – as with so much in Lancelot – is cooperation. This is what Peter needs to do. Ask the Grail knights to wait and do the following things while he takes the Grail:

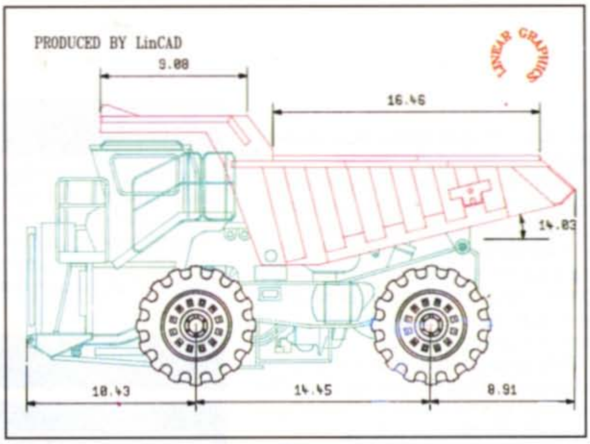
Throw water at the fire elemental, throw sand at the water elemental and blow the horn to eliminate the dust elemental.

Let's hope he's got these items handy.

Barbara Gibb has once again come to a reader's rescue. This time help is offered to Tony Marter stuck in **Castle Dracula**. To cross the abyss west of the kitchen he needs the plank from the bottom of the stairs.

Anticipating a further problem, Barbara says that Tony should cross the abyss, get the axe and chop up the plank – always supposing he's got the nails – so as to make a ladder which will prove useful past the pool of oil.





LinCAD Archimedes VERSION 1.2

To complement the advanced performance and technology of the Acorn Archimedes, Linear Graphics have developed LINCAD ARCHIMEDES – an equally advanced design, draughting, and graphic communication package. Release 1.0 of LINCAD ARCHIMEDES provides the foundation for a sophisticated 2D computer design tool suitable for a wide range of applications in education.

EASY TO USE

LINCAD ARCHIMEDES has been designed with the user in mind. The number of required keystrokes, either keyboard or mouse, have been minimised to speed up data entry. Pull-down menus are used through-out with extensive use of the mouse. Comprehensive use is made of help screens to aid the user. The package is self-adapting to the memory size and the monitor type of the ARCHIMEDES system in use.

NATURAL SCALING

LINCAD ARCHIMEDES provides a practical solution to the problem of switching between drawing and real-world environments. The screen drawing area resembles an A3 draughting area with fixed notional 1 cm intervals. The co-ordinate system however can be scaled from 0.1:1 up to 1,000,000:1. At all times you know the actual plot output size and the scaled size it represents.

DRAWING ELEMENTS

LINCAD ARCHIMEDES supports all of the commonly used drawing elements and more:

LINE	POLYGON	OPEN BOX	FILLED BOX
TRIANGLE	ARC	OPEN CIRCLE	FILLED CIRCLE
ELLIPSE	SPLINE	DIMENSION	TEXT
FREEHAND TRACE			

PNEUMATICS, ELECTRICAL and BUILDING LIBRARIES are available.

Advanced aids for drawing lines include horizontal or vertical grid-lines, parallel, tangential to arc or circle, tangential to two existing circles, perpendicular, at angle, bisector to a line, and perpendicular bisector to a line and bisector to two lines. Arcs, circles and ellipses may be drawn by specifying points or an extensive combination of points and parameters.

Drawing aids for arcs include arc through three points, arc by start, end and final centre point, arc by centre, start, and final end point, tangential extension to line and automatic filleting.

Construction aids for circles include tangential to two or three lines and tangential to line, arc or circle.

A further interesting feature is a dynamic mirror facility, a mirror plane can be positioned anywhere in the screen drawing area, any subsequent operation is reflected across in both directions across the mirror. This allows the user to judge the worth of the combined reflections as they happen,

The user has the choice of two text fonts. In addition text size, aspect and slope may be altered. Text following of circles and arcs allows scope for imaginative use for graphic communication.

Automatic hatching in any colour, hatch angle and pitch is provided. Any complex enclosed shape can be hatched in.

DIMENSION FEATURES

LINCAD ARCHIMEDES has a powerful auto-dimensioning feature that allows you to create complete dimensions by simply entering two locations. Leader lines, witness line, arrowheads and dimension value are automatically laid out.

Dimension types include horizontal, vertical, linear, diametric, radial, and angular.

If an element that has been dimensioned is subsequently changed in size using the group scaling command then the dimension value will automatically change as well to match exactly the new size.

A measure facility allows you to investigate all the parameters associated with a particular drawn item.

POINT LOCATION

Data points may be entered using the mouse pointer, all the data points are constrained to the grid lock spacing in use, however the lock spacing varies from .1 mm to 10 cm (actual size) allowing very fine control.

Snap to nearest point allows drawn items to exactly position with their nearest neighbour.

Data points may be entered via the keyboard as cartesian coordinates, or relative coordinates, or polar coordinates.

DISPLAY COMMANDS

Display commands are available using either function keys or the mouse pointer to zoom (up to 32 times), scroll or redraw the drawing. Because of the Archimedes high processing speed, drawing manipulation and redraw speeds are exceptionally fast.

SYMBOL LIBRARIES

LINCAD ARCHIMEDES will allow you to make any collection of items into a symbol. In this way symbol libraries may be compiled to suit any application. Symbols may be drawn at any scale or angle, copied, mirrored or distorted.

Drawings in HP-GL format (Hewlett-Packard Graphics Language), DXF format or Linsign format (Linsign is a poster design package available from Linear Graphics) may be imported into Lincad Archimedes.

TRACKING FUNCTION

A sophisticated tracking function automatically generates a track, with a set width from a series of straight lines. The generated track may be designed with either sharp corners, or corners rounded off by arcs or fillets or alternatively two spline curves are generated.

The tracking function may be used in conjunction with a regular polygon generator to easily generate cogs, wheels and other shapes that have a rotational symmetry around their perimeter. The symmetrical section is first stored in a track-file and then that section is repeated for each side of the polygon, in its correct angular position and size. Concentric symmetrical shapes can easily be built up.

EDITING

LINCAD ARCHIMEDES supports a wide range of editing functions that make the package both an exciting and useful C.A.D. tool. The block editing commands consist of:

ERASE	LOAD	SAVE	MOVE
COPY	ROTATE	SCALE	ROTATE & SCALE
MIRROR	DISTORT	COLOUR & ARRAY	CONVERT

The DISTORT command allows you to distort sections of a drawing into perspective or isometric views. The CONVERT command alters objects such as circles, or arcs into vectors to allow the DISTORT command to operate.

A number of single item editing commands are available:

ERASE	ERASE PART	CONVERT	ADJUST LINE
ADJUST SPLINE	MOVE ITEM	COPY ITEM	MEET LINES
ALTER COLOUR	ALTER STYLE	EXTEND	UNDO ITEM

The ERASE command operates on single items such as lines, circles and arcs while the ERASE PART operates on sections of single items that lie between intersections. The ADJUST commands allow lines and arcs to be altered in end-position and arc angle respectively. Extend command increases line length while the MEET LINE extends two lines together to meet at the calculated intersection.

All items of the same colour can be treated as a single layer allowing editing on just that layer. Items can be moved between layers using the block colour change command.

OUTPUT

Output is to Plotmate A3M Single pen, or Multi-pen, Plotmate Plus any HP-GL language plotter or GRAPHTEC plotter. HP Paintjet, HP Deskjet printers or laser printers. Epson compatible dot-matrix printers.

Other LINCAD version available for NIMBUS AX, VX, 286, 386, 186 and IBM compatibles. AMSTRAD 1512, 1640.

Linear Graphics Ltd,
Unit 39,
Mochdre Industrial Estate,
Newtown,
Powys SY16 4LE
Tel: 0686 629292
Fax: 0686 629563

Getta better ghetto blaster

Roland Waddilove tries a peripheral that beefs up your Archimedes' sound quality

MUSIC and sound effects have progressed a long way since the early days of the BBC Micro – boot up an old arcade game from way back in '82, close your eyes and listen to the simple tune and one or two sound effects.

Such simplicity wouldn't be tolerated now, and we expect a new arcade game to feature much more: On the Archimedes series' digitised sound effects including sampled screams, explosions and even record soundtracks are all possible.

While tremendous advances have been made in music and sound effects programming techniques the hardware doesn't do it justice – the sound is still emitted from a small speaker hence limiting its quality and quantity.

Fortunately, Acorn realised that better sound output could be achieved through dedicated hardware and fitted the Archimedes series with a stereo output. Now you can plug in your hi-fi, pump up the volume and let those sound effects reverberate around the house. But what if your hi-fi is in a different room?

Product: Sound Blaster
Price: £44.99
Supplier:Siren Software. 84-86 Princess Street. Manchester M1 6NG.
Tel:061-228 1831

From Siren Software comes a simple, neat solution by way of the Sound Blaster. It consists of a small amplifier with power supply, two loudspeakers and a pair of headphones (for when the neighbours are asleep).

Setting up the Sound Blaster is a piece of cake, you plug a lead from the amplifier into the Archimedes' plug the speakers into the amp, plug in the power supply and boot up your favourite software.

There are two volume controls on the wedge-of-cheese-shaped amplifier, one for each speaker. I don't know what the power output of the amplifier is, but turning up the volume to just one quarter of maximum is very loud indeed. There is certainly enough power to fill the largest of rooms.

You won't be disappointed by the quantity of sound, but what about the quality? Generally there is a noticeable improvement in sound quality, but what you hear ultimately depends on the software producing the sound. A poor sample will sound just as poor propelled out of the Sound Blaster, in fact, the sound is so crisp and clear that any blemishes quickly become apparent. On the other hand, well written music and quality samples sound superb.

Sound Blaster is aimed at two groups of people – game players who want to beef up the sound effects and the music hobbyist who likes to play music through the micro's internal sound chip. It is a doddle to set up and costs the same as just two arcade games so it won't break your piggy bank.

Summing Up

The unit is easy to set up and boosts both the quantity and quality of sound. No problems were experienced.

LS-1282
SoundBlaster
LS-1282

PLAY IT AGAIN SAM 12

... just another blag?

Price: £9.95 (tape) £11.95 (5.25in disc)
£14.95 (3.5in disc)
Supplier: Superior Software, PO Box 6,
Brigg, South Humberside DN20 9NH.
Tel: 0652 58585

SUPERIOR Software has celebrated the start of the new decade with the release of yet another compilation in the Sam series. Number 12 features four programs, two being original Superior games and two borrowed from other stables. Unlike some of the recent Sam releases, none is new.

First out of the box comes The Last Ninja, a true multi-screen arcade adventure with a bit of karate-type violence built in. Players control Armakuni, the last of the Ninjas, in his quest to gain revenge on the evil Kunitoki.

To start with, the game is simple. You travel paths in the wilderness and destroy opposing guards. At first you use only your fists and feet, but soon you will find a sword. Collectable objects all flash; some are weapons and others are used to help in your quest. Objects with magical properties can see you through very tricky situations.

One early problem encountered is a river with stepping stones. Crossing this needs a certain precision as you do flip-over leaps from rock to rock.

More of a problem is a dragon which guards the entrance to the wastelands. It doesn't like it when smoke gets in its eyes.

The wastelands – reached via an extra bit of code loading – feature cliffs, where a helping claw is needed, and narrow ledges where one false step spells disaster.

A plus point of the program is that when you lose your three lives – through bad fighting, falling or other causes – you re-start on the same level.

It's a pity there is not a password system, since each time you load the game you have to start from scratch.

After the wastelands come four more zones with more puzzles to solve and more guards to bash. If you pray at the shrines you are given advice about what to collect.

I wouldn't describe the graphics as amazing and the animation is rather erratic, but the gameplay is first rate.

Next comes Blagger, originally released by Alligata back in the year dot. And it shows its age.

The object is to steer your brightly coloured sprite around the screen, collecting all the keys and avoiding all the nasties.

Some platforms dissolve under your weight, so care is needed in planning a route. Other ledges move, and control is difficult.

The main problem for me was boredom. The movement is slow and this sort of game is hardly original

Blagger has very little to commend it except perhaps that the enhancements over the original were carried out by our very own Hac-man.

Skirmish is something else again. The graphics may look a little basic, but it can provide hours of entertainment for one or two players.

They fly their giant birds around the screen and attempt to joust with other knights who may also be mounted on ostriches.

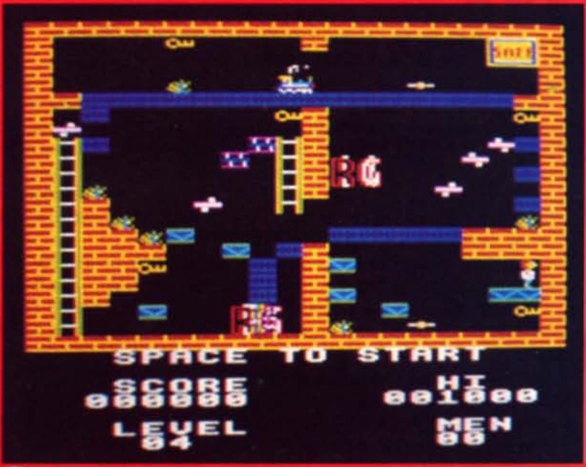
The bird riders carry lances and in any joust the winner is the rider with the higher lance. The players have blue or pink birds while micro-controlled opponents ride green monsters.

One key is used to make the wings flap and calls for a steady tapping, not a mindless bash.

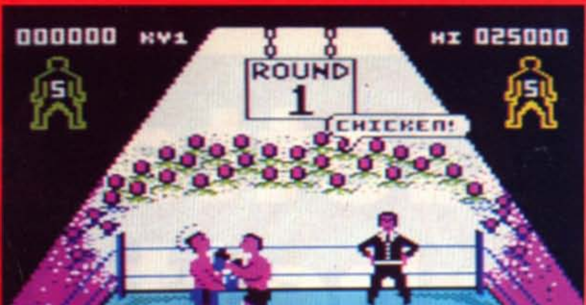
Two other keys are used for left and right but these only work in conjunction with the wings or when running on the surface.

Changing direction when running causes a most satisfying skid with an appropriate screech noise.

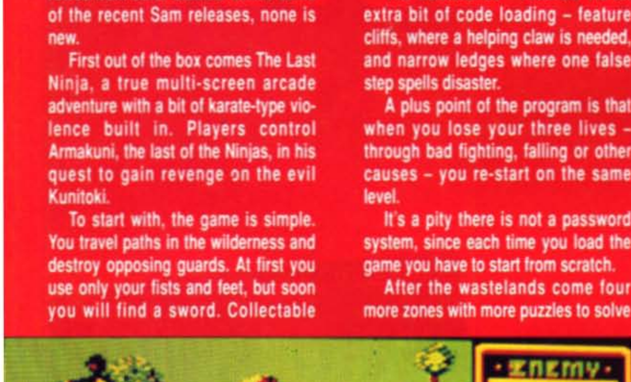
When an automatic rider is dismounted the bird lays an egg. It is as



Blagger



By Fair Means or Foul



The Last Ninja

well to catch these, since eggs can hatch out into new riders who exhibit greater skill. These riders wear blue hoods to differentiate from the red hooded unskilled.

The birds appear in waves, starting with three, the number increasing for successive waves. Some are team waves with bonus points for not jousting with the other players, while others offer points for defeating a human player.

Perhaps most feared is the pterodactyl. This may appear early if you are slow to defeat opponents, but will certainly turn up by wave eight.

This splash of colour is indestructible and very aggressive. It can easily drive you into the fires which have hand shaped flames reaching up for you. This game comes Hac-man recommended.

Final offering on Sam 12 is By Fair Means or Foul, a boxing simulation where cheating is allowed.

People familiar with karate games will be used to the 10 keys that are needed to play the game, but a joystick will make life easier.

Your aim is to become world champion by defeating each of six opponents or playing against another human.

Games are played over 15 rounds and can involve normal fair boxing manouevres.

The referee, however, is not really up to the job and it is easy to get away with fouls. These include head butts, kicks, kneeing and punching below the belt. An on screen indication shows the likelihood of the ref spotting these cheats.

Getting caught cheating involves the loss of a chance. You have five chances before being disqualified. Even some legal moves can lead to the loss of a chance life.

Master series machines benefit from an enhanced version which involves a tune – with controllable volume – a screen with pictures of the players and detail differences to the graphics.

All sounds can be turned off as can the amusing pieces of bubble speak from the crowd.

Sam 12 has three good games and one poor one. It is well worth getting if you need a couple of the games to complete your collection but don't bother with it if it's only for Blagger.

Rog Frost

Graphics	*9*
Sound	*7*
Playability	*9*
Value for money	*9*
Overall	*9*

RISC OS DESKTOP GAMES 1&2

... the easy life

Price: DeskGames 1 or 2 – £10 each
DeskGames 1 and 2 – £15 (one disc)
Supplier: Anonymouse, 2nd Floor, 3 Spring Garden Lane, Gosport, PO12 1HY
Requirements: Archimedes series or BBC A3000
Tel: 0705 511056

THE name Anonymouse definitely shows a sense of fun, and I think good humour is what you need if you buy this collection. There are two discs – DeskGames 1 and DeskGames 2 – but if you order them both you get five games on one disc which even then is less than half full. Still, it's not quantity that counts, so let's look at each in order.

On DeskGames 1, first up – apart from the advert – is **Icon Machine** which is a one armed bandit using the already-seen icons. There are nudge and hold facilities but no animation and hardly any sound. Clicking Menu on the window brings up two options: One to start again and the other presenting the scoring system.

Passing on quickly, we come to **Pair Match**. This has some nicely drawn playing cards but is the same as Icon Match – see later – except with four rows of 13 playing cards instead of icons.

With despair beginning to set in we get to **Reversi** – otherwise known as Othello. The board for this is small but quite pleasant and it's easy to grasp the strategic positioning of the pieces.

Four levels of skill are selectable and, unlike any other game in this collection, the options include having the micro play both sides or having two human players – if only the others games had these facilities.

This is the third version of Reversi to appear on the Archimedes, the earlier ones being on the Arcendium by Dabs Press (reviewed April 1989) and Family Favourites from Minerva (reviewed February), neither of which were multi-tasking.

Of these two only the Arcendium version played a strong game – in fact it was almost unbeatable at high level – while the Minerva version was a walkover.

The four Anonymouse levels show a decent gradation from easy to very hard – an excellent piece of programming.

DeskGames 2 starts with **Icon Match** which is Pelmanism for one person. Like all the rest, it comes up on the icon bar and clicking its icon puts a large unsizable window up with five rows of ten blank icons.

You click one and it turns over – no actual animation here – and reveals an icon that the program has picked at random from the system pool, so you could get the alarm bell, printer driver or anything that your system has seen this session.

Then you click another blank to see whether it matches. If it does nothing happens, if it doesn't you get exactly the same response so the only thing left is to try clicking another one.

Now if your previous two choices matched they stay on screen, if not they revert to blanks and your new choice appears.

The game is satisfactory but is only single player – it even lacks an against the micro option, and has no sound effects. Clicking Menu on the window gives you the single option to start a new game.

Pontoon – Twenty-one – is a simple card game and this version matches it. You have single player vs micro-as-banker and as such it is reasonable, but only proves what any statistician would tell you – the House always wins eventually.

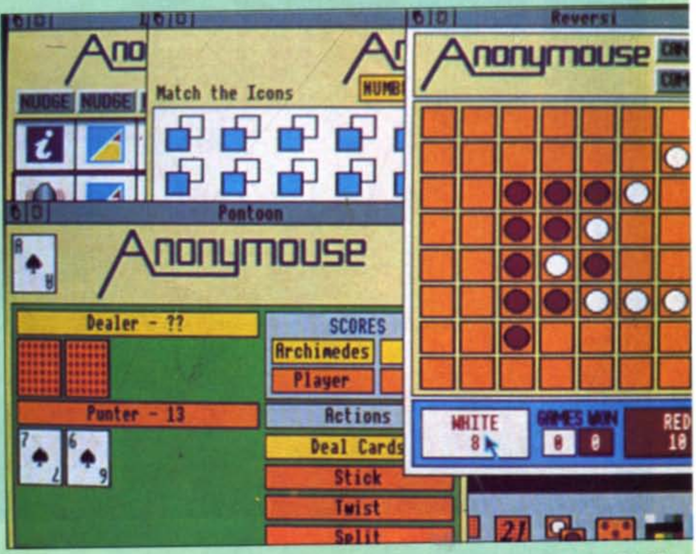
Finally, heaving a sigh of relief, we come to **Yahtzee**. The graphics are again quite acceptable but it's only a one player game, so what's the point?

There is some sound on here – A beep when you roll the dice. So you spend a minute clicking the *Roll dice* and eventually fill up your score card and what happens when you've completed it? Nothing.

Most of these games are a waste of time and money – with the notable exception of Reversi. Making them two player – even if it's not against the micro – would at least relieve the tedium of playing through them on your own.

Minerva proved you can make good playable and interesting games on the DeskTop with its Casino collection which had excellent graphics plus lots of animation. If Minerva can do it so can Anonymouse.

Sound	*1*
Graphics	*6*
Playability	*3*
Value for money	*3*
Overall	*3*



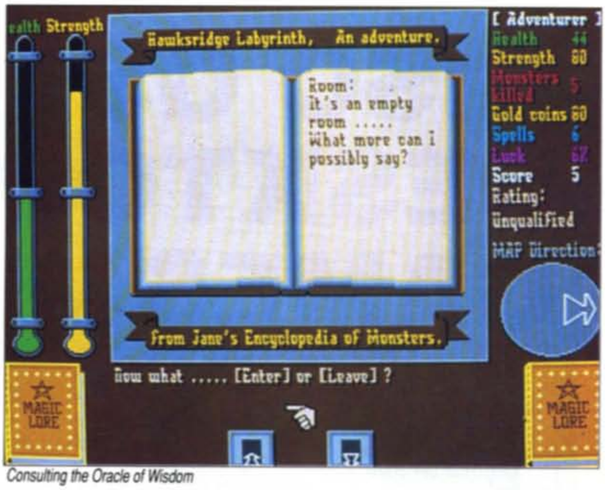
HAWKSRIDGE LABYRINTH

... in the underground

Price: £20
Supplier: Anonymouse, 2nd Floor, 3 Spring Garden Lane, Gosport PO12 1HY
Requirements: Archimedes series or BBC A3000
Tel: 0705 511056

THE second offering from Anonymouse is a so-called role-playing graphic adventure. So-called because it is similar to the table top swords and sorcery-style games in that you wander around an underground network encountering various creatures and disposing of them. Role-playing has nothing to do with it.

Booting the disc results in a very swish title screen – with Demo Copy stamped across it – and from there you move to the main display. This consists of a central area that displays the current room and on the left are two thermometer-type scales showing your health and strength.


ealth Strength
Hawksridge Labyrinth, An adventure.
[Adventurer]
Health 44
Strength 60
Monsters killed 5
Gold coins 60
Spells 6
Luck 67
Score 5
Rating:
Unqualified
MAP Direction:
From Jane's Encyclopedia of Monsters.
MAGIC LORE
MAGIC LORE

Room:
It's an empty room .....
What more can I possibly say?

Now what ..... [Enter] or [Leave] ?

Consulting the Oracle of Wisdom

To the right is a list of statistics monitoring health and strength in numeric form, number of monsters killed, gold coins collected, number of spells available, luck – starting at six per cent – score, rating and compass direction. These alter continuously as you proceed. At the bottom of the screen are four icons, one to show the currently mapped area and three direction arrows: Turn left, move forward and turn right. There's also a space for a save icon which wasn't available on my copy. While you are taking all this in a little message tells you that the labyrinth is being created – an indication that each new one is random. Then away you go – you seem to be teleported into the labyrinth and somewhere there is an exit.

The main display shows the wall immediately in front of you, and to the left and right and the basic blank walls are overlaid with a corridor exit, open door, closed door, hole in the wall or occasionally a burning torch as appropriate.

If you turn left or right the display is updated to show the new view of the current room. This system works well, but gets boring after a while.

Moving to a closed door triggers a request as to whether you wish to listen at it or enter. On every single occasion I have listened – but heard nothing.

Hopefully the complete version will provide a message – or even genuine sound. Having listened you can enter or withdraw.

Approaching an opening of any variety results in a message saying what's inside and either it comes out to get you or you can go to get it – it's always an *it* and never a *them*.

At this point you may also click a query icon to see if there's any information about the creature.

What you get is a picture, a short summary of its habits and the number of *hits* it has – apparently taken from Jane's Encyclopedia of Monsters.

Once you've encountered something you have a simple choice: Fight or follow the example of Brave Sir Robin and valiantly run away.

Unfortunately the monster is likely to give chase so you may end up having to fight it anyway. Once the decision to enter combat is made you are given the chance to select your weapon from the inventory of everything you've picked up – this is the only way of looking through what you've got.

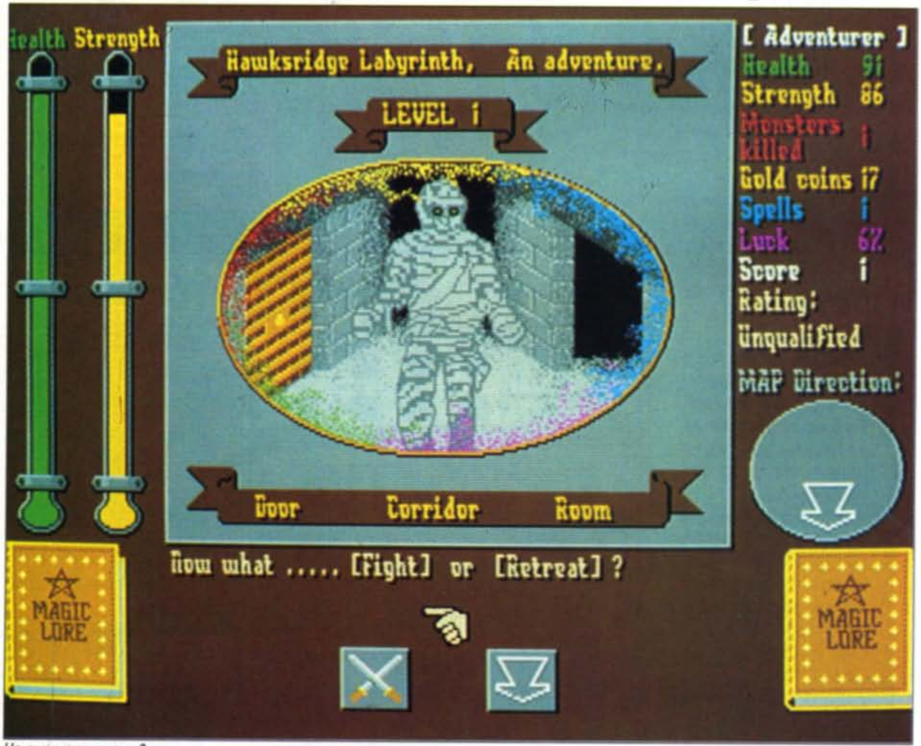
If there is any treasure lying around it is picked up automatically and you're told what it is. The sort of things you get are food, drink, potions – all of which help to restore your strength and health – weapons, magic wands and spell books. These final items also improve your characteristics – a situation I found very curious but typical of the hack and slash genre.

I can't say I really enjoyed playing Hawksridge Labyrinth, and even with the improvements that are promised for the finished version – digitised sound, monsters that fight back and so on – I can't help feeling it lacks life.

I play a lot of role-playing games and while I appreciate the difficulties of creating *thinking* monsters Level 9 succeeded on the 8 bit BBC Micro.

Despite all the graphics, potential sound effects and smooth speed and control, Hawksridge Labyrinth is a very primitive program. If you like hitting things with no thought required buy it.

Geof Brown


ealth Strength
Hawksridge Labyrinth, An adventure.
LEVEL 1
[Adventurer]
Health 91
Strength 86
Monsters killed 1
Gold coins 17
Spells 1
Luck 67
Score 1
Rating:
Unqualified
MAP Direction:
Door
Corridor
Room
MAGIC LORE
MAGIC LORE

Now what ..... [Fight] or [Retreat] ?

Have you seen mummy?

Sound	*N/A*
Graphics	*8*
Playability	*6*
Value for money	*3*
Overall	*5*

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ROTOR

... getting in a spin

ARCANA is a software producer unknown to the BBC Micro market until now as it has previously specialised in the 16 bit machines.

Booting the game reveals a high quality loading screen of a space vessel blasting its way into your monitor. Pressing the spacebar takes you on to another excellent display.

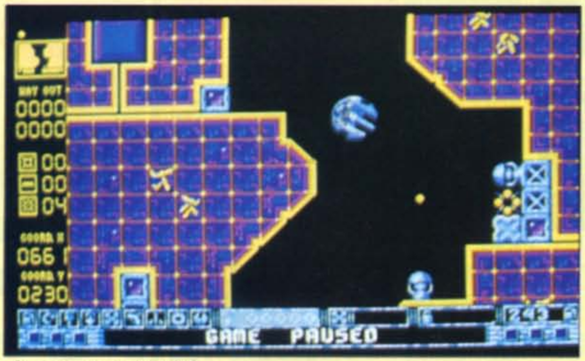
There's a list of options down one side, lights altering and flashing all over the place and a message is typed out in the middle.

The scenario involves you – a Rotor pilot trying to work your way up the ranks – invading alien caverns, opening up canisters, collecting their contents and then blasting the empty remains into oblivion.

When you start up you have three options – manoeuvre simulation, combat simulation and missions. To get on to the missions you must score a certain number of points on the simulations. Once promoted to the higher ranks, you get passwords to enter at particular levels.

It's definitely worthwhile reading the documentation about the controls – you can use the mouse but it isn't easy – and exactly how to get out of the caves. I escaped about five times before I discovered what was happening.

Selecting missions from the start-up screen results in a request for a password which is entered using the awkward arcade method of rotating through the letters then clicking for the one required – I don't know why since all micros have perfectly decent keyboards. While you gain points and have to reach a certain level before being promoted – it is you who decides whether or not to be promoted – you don't have to be if you don't want to.

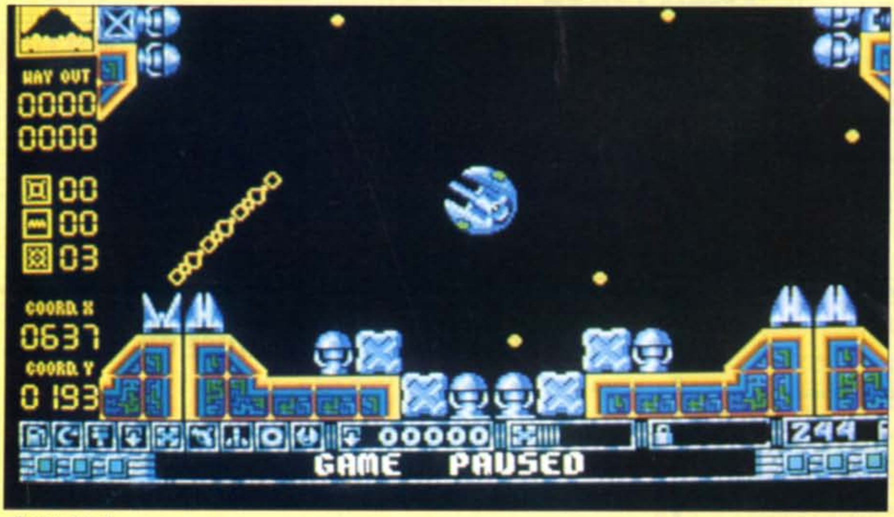


Careful manoeuvring is required

Moving on to the game, you are teleported into the caverns – all rendered in bright colours with lots of variety in the sprites.

The display occupies about two-thirds of the screen, which provides the equivalent vertical resolution to an Amiga. I'm afraid this is something we'll have to get used to when it comes to multi-format games.

Your ship is circular and starts pointing upwards. Thrust is only possible from the rear so to move left and right you turn the ship and perform an engine burn.



The highest level

Your gun only fires forwards so to shoot down you have to rotate and then gravity starts to become a problem. It's a delicate matter of rotating, shooting, and turning back to thrust before you hit ground.

Does this sound familiar? Well, the game is just like Thrust for the 8 bit BBC Micro, but thankfully you don't have to drag heavy lumps around on tractor beams. Instead canisters are lying around which when shot open to reveal one of three objects:

First are the power plants which you have to pick up within a certain time limit otherwise they explode taking you with them. Unfortunately when you do pick them up they add to the mass of your ship making it harder to control and using up more fuel.

Then there are the sun crystals of which you must collect a certain number before being given the exit coordinates.

The final and most useful items are colour-coded pearls which provide energy which your built-in transformer can convert into useful items, like fuel, extra rotation speed, more powerful engines, more powerful laser, duplicate ships and a host of other options.

One special pearl provides 200 units of fuel – it's marked with an F – and another is a wild card which advances the transformer selector a random amount. The selector wraps around when it reaches the highest value.

You don't get things all your own way of course, and the aliens fight back – thankfully with only fixed position bases.

While they don't seem to be very good shots, enough of them can pepper your hide to get you scurrying in search of pearls to rebuild your armour-plating.

There are three missions to carry out on each level and – I think – about five or six levels, which provides plenty of scope. On higher levels each of the canisters and gun emplacements can take more hits before being knocked out.

Other unpleasantnesses also appear: Pushers and pullers fling your ship about and you must build up your engine thrust to compensate. Then there are force field walls which can be turned off for only a short time and weird guns which fire diagonal rays.

The sound is adequate although I think they've only used one or two channels – the volume drops too much on four or eight – but there's no music. Bit of a shame really.

Complaints? Just two: After spending an hour building up a well-armed and fast Rotor it's really annoying being unable to save my status and having to start again from scratch.

Additionally the highest level is almost impossible without a enhanced Rotor, but you can't start at a lower level and then – using a password – jump to a higher one. You can only proceed from the point you start at.

This game is extremely addictive – it's just hard enough to make it a challenge and there's enough variety to make it interesting, despite being so simple.

The only reason I haven't awarded nines and tens in its scores is that we need to be able to move up in the scoring. The game-writing professionals have arrived – at last

Lazarus

Graphics	9
Sound	7
Playability	9
Value for money	8
Overall	8

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The return of the flasher

Mike Cook demonstrates how you can keep an eye on your drive

ONE thing I miss about the first home micros of the mid-seventies is all the flashing lights they sported. In those days LEDs were connected to the address bus, data bus and in fact every other signal you could think of.

Whenever it was running, an impressive mass of flashing lights gave you an insight into what was going on inside the machine. Also very useful to impress visitors.

And I got to thinking that maybe it would be useful if we could coax a little more information out of our micro.

At home the gentle rhythms of the clunking disc drive let me know what's going on, but in a high ambient noise environment, or with some of the quieter drives, those reassuring sounds are absent. So let's look this month at a way to monitor the disc drive's activity visually.

Micro and drive are connected by a bus – a number of standard signal wires that allow communication – and we can tap into them to monitor the way the drive is being operated.

For example, there is the write-protect signal which tells the micro that the write-protect notch on the disc has been covered.

If this were connected to a light we would know if we had a protected disc before we attempted to write to it.

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Similarly, the index signal produces a pulse each time the disc rotates. If taken to a light it would flash indicating that all was well with the disc.

No flash would show that the disc could be missaligned, and variations in flashing speed would warn of motor regulation problems.

We can monitor the write enable signal to show us the disc is being written to and the side signal to tell which surface of the disc is being accessed. There are two ways in which the disc drive bus can be operated – simplex and multiplexed – and this affects the forms of monitoring we can perform.

In the former the signals are always active, so, for instance, the write-protect line reflects the current state of the write-protect notch. This form of operation is only suitable for single disc drives.

For dual drives one cable has to carry the signals from the two drives, so the multiplexed mode is used. This is done by making the disc drive which is currently being accessed send the signal. Consequently when no drive is being accessed no signal is produced.

From this you can see that it is possible to use a single drive in both modes and this is why most are set up by the dealers to work in multiplex.

If you look where the ribbon cable connects to the disc drive you will see a number of links or shorting pads which are mainly used to assign the drive number to the physical drive.

However you should see one labelled MUX, and if this is open the drive will work in the simplex mode. So first let's see how we can monitor a single drive in this mode.

As the signals are available all the time in simplex mode, the most useful information can be obtained by monitoring the signal lines.

All signals on the drive bus are active low – they produce a logic zero when the function is true. For example, the write-protect line goes low when the write-protect notch is covered.

All we need to do is use this signal to turn a light on when it is low, but in order to prevent excessive bus loading it is a good idea to buffer the signals.

We can do this with a simple inverting buffer – the 74LS05 contains six with an open collector output, and Figure I shows how we can use it to light some LEDs.

Note that we can use the buffers to either short out the LED, and so turn it off when the buffer is on, or we can use the buffer turning on to complete the circuit.

We want the write-protect LED on when the buffer is driven by a logic 0 on its input. As this is an inverting buffer, it produces a 1 on the output, so this stops shorting the light and allows it to be lit.

In contrast, the unprotected LED is lit when this same line is at a logic 1, so we need to make the consequent zero at the output complete the LED circuit.

As you will see from Figure I, we have a similar arrangement for the direction signal line. Lights indicate if the head is being moved in or out and the side LED indicates which side is being accessed.

In contrast we only need single lights to know whether we are at track zero or writing to the disc.

The index signal is a little more complicated: As this produces only a short pulse there would be little indication that it was active. So we send it to a four bit counter circuit and can then tap off the flash rate we like the most. If you want to make some of these signals more interesting you can use LEDs of different colours – as well as the standard red you can also get green and yellow.

The most interesting type gives you two LEDs of different colours within a single package – most common are red and green.

So for the write-protect signal you could have the indicator light simply change colour. Incidentally, if both LEDs are on together a yellow light is produced.

However these dual types of LEDs normally have a common cathode so you will need a slightly different arrangement to drive them. This is shown in Figure II.

It is possible to monitor the position of the disc's read/write head as indicated in Figure III. Basically we take the head step signal and use it to clock a counter.

As the head can move both in and out, we use the direction signal to control the direction of counting. Finally the track zero indicator is used to reset our counter so that it is synchronised with the head.

The 74LS190 is a BCD – binary coded decimal – bi-directional counter, so for a 40 or 80 track drive we need two. Each feeds into a 74LS49 BCD seven segment decoder/driver.

This device converts the binary count to the signals needed to light the segments of a display. It also contains buffering circuitry to drive the display.

With this circuit it is possible to keep a visual track of where the disc head is positioned, so you can see at a glance if you are needing a lot of retries when reading a file.

This is often the first indication that a disc is beginning to wear out and it is time to make a backup. If the disc access fails normally the head is sent back to track zero and back again to the required track.

When it comes to a dual drive system the signal information is only available during disc access. Therefore if we are going to monitor this activity we will only see what is happening at the time of access. Nevertheless we can still perform some useful monitoring – this is shown in Figure IV.

The main difference between this and the single drive system is the circuitry showing what drive is being accessed. Not only do you have to distinguish between the two drives, but also each side of the disc.

This is best dealt with by using a decoding chip – I mainly use a 74LS42, which gives a separate light for each one of the four possible surfaces being accessed.

If you want to keep track of the head position in a dual drive system you need the circuit shown in Figure V. This is basically two single drive systems, like Figure III, but arranged so that the drive access only activates the appropriate counter.

Note that this access is also extended to the reset line, again so that the track zero signal only resets one counter. This dual counter arrangement is needed because

➤

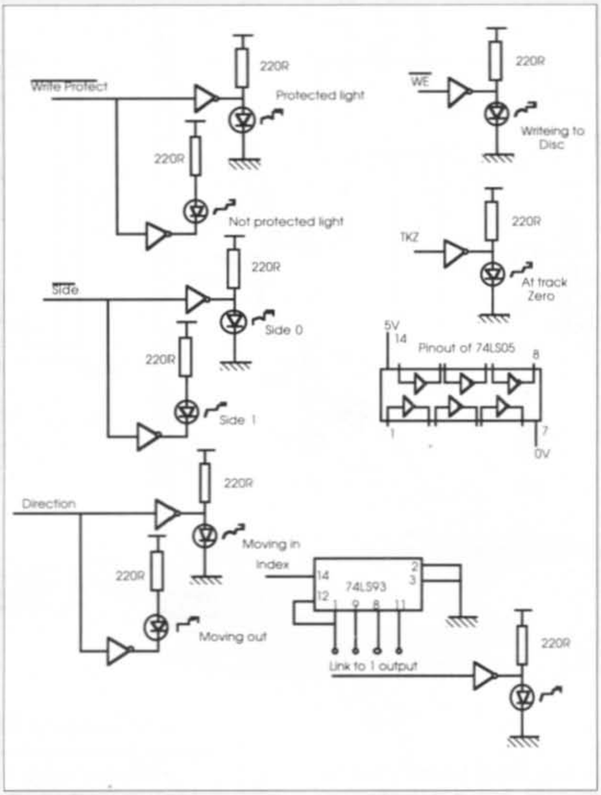
Write Protect
220R
Protected light
220R
Not protected light
Side
220R
Side 0
220R
Side 1
Direction
220R
Moving in
220R
Moving out
WE
220R
Writeing to Disc
TKZ
220R
At track Zero
5V
14
Pinout of 74LS05
8
1
7
0V
Index
14
12
74LS93
2
3
1 9 8 11
Link to 1 output
220R

Figure I: Single disc indicators

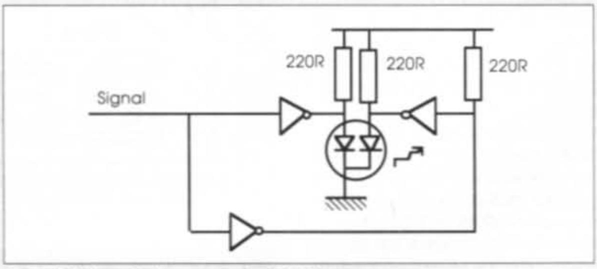
220R
220R
220R
Signal

Figure II: Using a dual common cathode LED

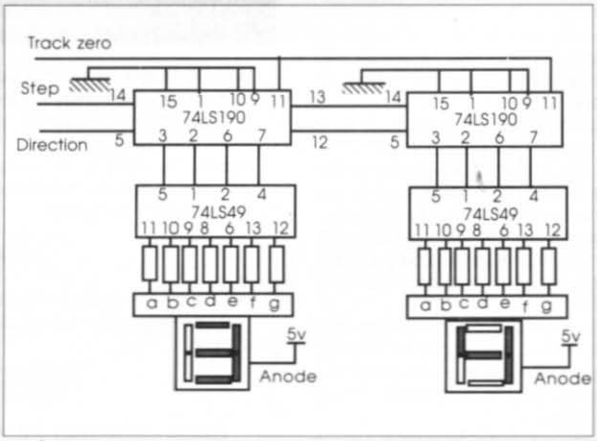
Track zero
Step
Direction
14
15 1 10 9 11
74LS190
5
3 2 6 7
13
12
5 1 2 4
74LS49
11 10 9 8 6 13 12
a b c d e f g
5v
Anode

Figure III: Monitoring the head position

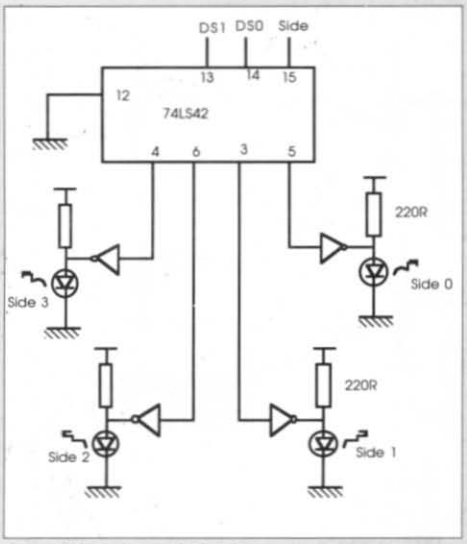

Figure IV: Twin disc dual side indicator

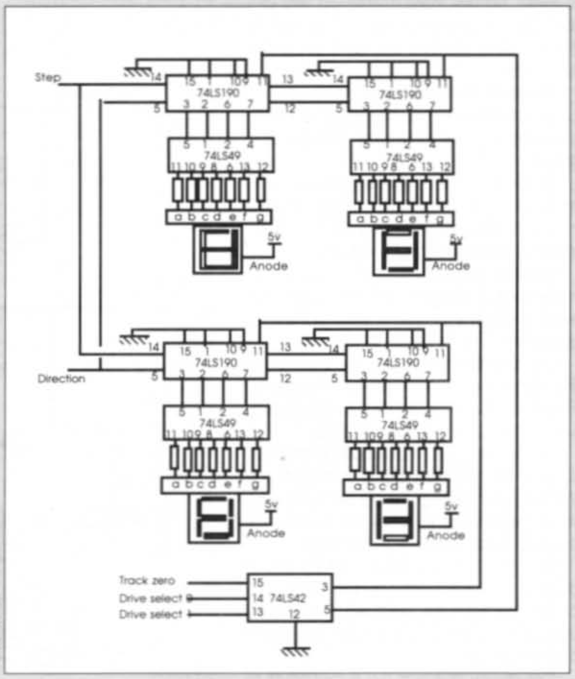

Figure V: Dual disc track indicator

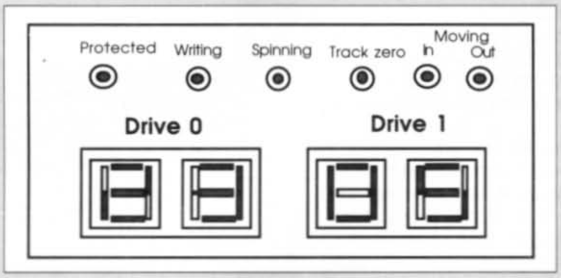

Figure VI: The suggested panel layout

the disc controller in the micro has two counters keeping track of the head position of the two drives.

You could get away with one, but that would get out of synchronisation if the drives were swapped and not zeroed. This will not happen very often, but it is annoying when it does.

There is no kit this month as all the components are readily available and most people will only want to implement a few of the suggested monitoring options – construction is not critical as regards layout.

In order to tap into the drive signals you need to fit another insulation displacement socket between your micro and disc drive.

Make sure the notch on this socket points in the same direction as the one for the micro. If it does, Figure VI gives the signals on the plug as viewed from its under side.

You also need a 5 volt source to drive the lights which you can get from the user port or the auxiliary power socket on the micro's underside. If you are using this socket to power the drive – you shouldn't, as I always recommend a separate supply – a simple splitter lead will allow you to tap the negligible amounts of current to drive the LEDs.

So there we have it, a nostalgic return to micros of days gone by when flashing lights told you exactly what was going on. I don't know how I have survived so long without them.

See you next month for another exciting instalment of the Beeb Body Building Course.

MICRO MEMORIES

Facts and tips you may have forgotten...or never known

WHEN programs prompt you to press the spacebar to continue they are sometimes incorrecty coded – any key moves the program on. This is because the programmer has just used a statement of the form X=GET.

To wait until a specific key to be pressed a REPEAT...UNTIL loop should be used to check for its Ascii value. The most common keys to use in this context are Return and the spacebar with codes of 13 and 32 respectively. So typing:

```
REPEAT UNTIL GET=32
```

will cause the program to pause until the space bar is pressed.

If you want any key to allow the program to continue the command is similar:

```
REPEAT UNTIL GET
```

This is better than the frequently used X=GET because there is no danger of clashes of variables and you are also saving memory.

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Simplicity itself

Hac Man reveals more ways to beat the programmers at their own game

Featuring... Overdrive, Positron, Uridium, Sim

IN last month's column I featured a conversion routine to allow the arcade-adventure *Sim* to run on the Master 128. However, what that routine did was to make the game work, not make it playable, at least by any normal games player. Listing I should rectify the situation for all 8 bit micros, providing options of extra or infinite lives.

As usual, enter the listing as shown, then save it on to one of your own blank tapes. Type RUN and follow the onscreen instructions.

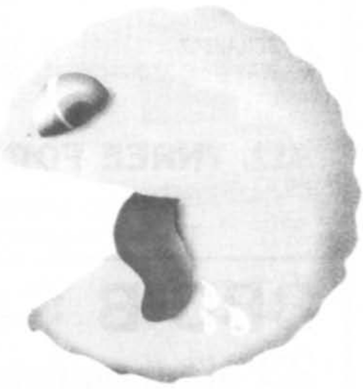
This routine also modifies the default *get* key from cursor up to hyphen/pound if the machine it's running on is a Master. This is because the up and down keys – the default get/drop keys chosen by the program – are not quite so conveniently located on the Master.

For good measure I have also included the necessary three lines from last month's listing to ensure that the modified program is compatible with the Master.

As I have written it, the program provides infinite lives, with three lives – the default number – displayed on-screen. However, if you want 20 lives rather than an infinite number, change the value of *L%* in line 100 to 20 and delete line 130 before typing RUN. Happy Simming!

```
10 REM Sim extra or infinite lives
20 REM by Hac-Man 1989
30 REM (C) The Micro User
40 M%=INKEY(-256)
50 IF M%<200 OR M%>253 THEN 100
60 acccon=&FE34:?acccon=&18
70 FOR J%=0 TO 31
75 K%=J%*640:P%=(2*J%)+&C375
80 [OPT2:EQUB K%DIV256:EQUB K%AND255
90 ]:NEXT
100 L%=3:REM Number of lives (1-255)
110 FOR I%=0 TO 2 STEP2:P%=&120:[OPT I%
120 LDY #&AD:STY &19DE \ infinite lives
130 LDY #L% :STY &198C \ num of lives
140 INY:INY:STY &22D1
150 JMP &1900
160 ]:NEXT
170 K%=58:IF M%>128 AND M%<254 K%=41
180 *KEY0 LOAD"SIM"|M 95GT=K%|M 730*LO.S
IM2|M 735!&4135=&0801204C|M 737CALL &400
0|M RUN|M
190 MODE 7:*FX15,0
200 PRINT "Please insert Sim tape, fully
 rewound and press any key...";
210 G%=GET:PRINT':*FX138,0,128
220 END
```

Listing I: Sim extra or infinite lives



Searching for gold

A few years ago there appeared a sideways-scrolling shoot-'em-up by the name of **Uridium**. This was, in fact, the game on which Gary Partis' enormously-successful Psycastria was based.

I recently received a letter from Michael Hugh in Belguim asking if the game is still in production, because he has lost his copy.

I checked with Hewson, the publishers of Uridium and unfortunately the game is no longer in production. Nor have I been able to find any supplier who still has stocks of it. Sorry.

And mothership makes three

Micro Power's Positron is a simple shoot-'em-up, not particularly remarkable in itself, but noted for being the first offering from Gary Partis, later known for such games as Psycastria and Impact.

Robin Pike from Girton, near Cambridge, has sent me a routine containing pokes that will be of use to any Positron players having trouble. It allows you to award yourself infinite lives or to set the number of lives you require up to a maximum of 255.

You can also specify the number of aliens on all but the introductory sheet to each wave and the number of bullets they can fire.

A number of important points should be noted. If you choose to play with infinite lives you will not be able to press Escape to quit, because the program has been written so that pressing that key reduces your number of lives to 1, then sets a flag indicating that you have lost a life.

Under normal circumstances your number of lives is then further reduced to zero and the game ends. However, the infinite lives poke removes the instruction that decrements the number-of-lives counter, so the *dead* flag is never cleared. As a result, the game loops continuously, displaying one exploding Positron after another.

Note carefully the maximum and minimum values allowed for each poke, because any value outside that range will crash the program. One particular point is that the number of aliens on sheets 2 to 9 can be any value between 1 and 20, with the exception of 2.

If you mistakenly select this value the mothership never appears – all you can do is shoot the Mega Bods until the time runs out.

Incidentally, Gary Partis will be making a return to the Acorn software scene in the not too distant future with a BBC/Electron games emulator for the Archimedes.

I have no definite idea of the likely time scale at present, but this news came direct from the horse's mouth, so I am sure of its accuracy.

Into overdrive

Many veteran BBC Micro owners will remember a car racing game called **Overdrive** written by Peter Johnson and published by Superior. Although it seems primitive by today's standards, it was very popular in its heyday. Indeed, to this day it remains Superior's biggest selling title ever.

The point about Overdrive that always sticks in my mind is that I always found it extremely difficult to get past level 2 – the

➤

```
 10 REM Overdrive pokes
 20 REM by Graeme Dignan
 30 REM (C) The Micro User
 40 REM
 50 ENVELOPE 1,3,0,0,0,0,0,0,126,-15,0,-
5,126,100
 60 ENVELOPE 2,4,-1,-2,-3,2,2,2,126,0,-3
0,-30,100,100
 70 ENVELOPE 3,2,-5,4,1,1,1,1,126,0,0,-5
0,126,126
 80 S%=1:REM start stage (1-5)
 90 C%=43:REM number of cars to pass
100 oswrch=&FFEE:char1=&80:char2=&E0
110 FOR I%=0 TO 2 STEP2:P%=&900:[OPT I%
120 LDA #char1:STA &70:JSR write
125 LDA #char2:STA &70
130 .write LDA #0:STA &71:TAY
135 LDA #&C:STA &72
140 .nextchar LDA #&17:JSR oswrch
145 LDA &70:JSR oswrch
150 LDX #8:.loop LDA (&71),Y:JSR oswrch
155 INY:DEX:BNE loop
160 INC &70:CPY #0:BNE nextchar:RTS
170 ]:NEXT
180 MODE 7:*FX15,0
190 PRINT "Please insert Overdrive tape
and press any key...";
200 G%=GET:PRINT'
210 *LOAD OVER2 2300
220 IF S%>0 IF S%<6 : ?&244E=ASCSTR$S%
230 ?&2566=ASCSTR$(C%DIV10)
235 ?&2567=ASCSTR$(C%MOD10)
240 *KEY0 PAGE=&2300|M END|M OLD|M 18CAL
L&900|M 130!&DCC=&D00F9F8C|M RUN|F|M
250 VDU 21:*FX 138,0,128
```

Listing II: Overdrive pokes

```
 10 REM Positron pokes
 20 REM by Robin Pike
 30 REM (C) The Micro User
 40 REM
 50 L%=3:REM Number of lives (1-255)
 60 A%=20:REM Number of aliens on sheets
 2-9 (can be 1-20 but NOT 2)
 70 M%=5:REM Missiles fired (1-10)
 80 FOR I%=0 TO 2 STEP 2:P%=&900:[OPT I%
 90 LDA #&A2:STA &4967 \ infinite lives
100 LDA #L% :STA &485D \ num of lives
110 LDA #&FF:STA &4B27
120 LDA #A% :CMP #2:BNE stashit
130 LDA #3:.stashit STA &4E4F \ aliens
140 LDA #M% :STA &4E89 \ missiles
150 JMP &3D06
160 ]:NEXT
170 MODE 7:*FX15,0
180 PRINT "Please insert Positron tape a
nd press any key...";
190 G%=GET:PRINT':*LOAD POSI1
200 CALL &900
```

Listing III: Positron pokes

The first great year

This column is now well into its fourth year and even I am having difficulty in remembering in which issue a particular tip, poke or piece of news appeared. Consequently, in response to a request from a reader and occasional contributor, Walt Patterson of Amersham, I have decided to put together a brief summary of the contents of each column of my first year: March 1987 to February 1988.

Please note that pokes for the compilation versions always state that they are for that one on the collection. For example, in my very first column I featured pokes to provide infinite lives and infinite fuel for what was at the time the only cassette version of Thrust.

When Thrust was subsequently rereleased on the first Play It Again Sam compilation it appeared in a slightly different format to that of the original. This meant that the original pokes would not work on the new version, so I devised similar pokes that would. These modified pokes appeared in the June 1988 column.

Similarly, I recently received a request from Alan Hammond of West Mersea, Essex, for the full set of passwords for Repton 3. From this list it can be easily seen that they – together with the appropriate edit codes – appeared in my second-ever column, in April 1987.

Incidentally, I will be featuring similar summaries for the years March 1988 to February 1989, and March 1989 to February 1990, in the next two columns, so keep a look out for them. Until then, here are the columns of my first year:

March 1987

Jet Set Willy II cassette upgrade
Thrust cassette infinite lives/fuel pokes
Yie-Ar Kung Fu hints

April 1987

Repton 3 passwords, edit codes and edit code generator
Commando tape pokes

May 1987

Psycastria cheat mode
The Big KO passwords
Commando disc pokes
Elite commander file transfer
Stryker's Run solution, extra lives for 5.25" disc version, extra lives for Master Compact disc version, conversion for enhanced game – disc version – on Model B with Solidisk Fourmeg board

June 1987

Thunderstruck II solution, cassette and disc pokes
Sphere of Destiny write-up
Stryker's Run conversion for enhanced disc version on Model B with Solidisk 128K ram board or Watford 128k rom/ram board
Repton 3 timer pause, viewing maps of hidden screens – disc version – and layout of saved screen files

July 1987

Wallaby 128 lives – original and Superior Collection cassettes
Space Pilot level jump
Battletank high score editor – Superior Collection cassette
Jet-Pac master compatibility, cassette conversion
Repton 3 disc pokes

August 1987

Repton passwords update
Repton 3 disc pokes update
FireTrack cheat mode
Sphere of Destiny cheat mode
Snapper upgrade – Mk1 and Mk2 cassettes and disc

September 1987

Explanation of how pokes are implemented using **Arcadians** and original and Superior Collection cassette versions of **Wallaby** as examples
Around The World write-up

October 1987

Codename:Droid write-up
Colossus Chess write-up
Future Shock cheat mode
Arkanoid write-up
Graham Gooch's Test Cricket write-up
XOR maps write-up
Cholo disc not compatible with Watford DDFS data
Imogen passwords, conversion to Opus Challenger and extra metamorphoses
W.A.R. tip
Dunjunz joysticks converter
Blagger level jump and extra lives

November 1987

Stryker's Run enhanced game cheat mode
FireTrack disc write-up
Cholo solution
Repton Around the World in 40 Screens Orient file bug fix
Repton 3 disc pokes update

December 1987

Around the World in 40 Screens write-up
Chrysalis Master conversion – Character row multiplication problems
Arkanoid Master conversion and reduce speed cheat
Codename:Droid to Opus DDOS conversion
Mr EE write-up, infinite lives and Master conversion
Grand Prix Construction Set cheat
Mr Wiz level jump
XOR hidden maze
Imogen cheats
FireTrack extended cheat mode
Nec Pluribus Impar write-up

January 1988

Contraption cassette mini-upgrade
Stryker's Run infinite lives routines – 5.25" disc standard version, 5.25" disc enhanced version and 3.5" Master Compact disc enhanced version
Galaforce disc pokes
Dunjunz slow-down – cassette version
Starquake teleporter codes
Gary Partis write-up
Spy Hunter hints
Airwolf hints
Cholo incompatible with Opus DDOS write-up
Arkanoid level jump
Wizzy's Mansion cheat mode write-up

February 1988

Airwolf map and solution
Mineshaft Master conversion

A text file of this pokes compilation is on this month's subscription disc and tape so that you can load it into your word processor or database.

night-time scene.

Even if I cheated and started on level 3, I would complete levels 3, 4 and 5, restart on level 1 and fail to complete level 2. Illogical, I'm sure, but that's what I found.

However, if I am not the only player in this boat, Graeme Dignan of Musselburgh, Scotland has the answer.

The routine he's written – Listing II on the previous page – allows you to vary both your start level and the number of cars that you must pass in order to be promoted to the next level. Take particular care when typing in line 240.

To alter the level on which you start, simply change the value of *S%* in line 80: It can be any number between 1 and 5. Similarly, the value of *C%* in line 90 specifies the minimum number of cars that you must pass before your time runs out.

I tested these pokes on the original 1984 cassette version of Overdrive, but I have not yet been able to test them on the Superior Collection versions of the game. Please let me know if you want pokes for these versions of Overdrive.

For good measure, I have also included suitable code to make this version of Overdrive Master-compatible.

So whichever 8 bit micro you have you can now play this great game.

MICRO MEMORIES

Facts and tips you may have forgotten...or never known

ERROR reports on the BBC Micro are quite user friendly, but don't rely on them too much.

While they give a guide to where your mistake lies, remember that they can be misleading, as this sample program shows:

```
10 INPUTnuber
20 PRINTnumber
```

This will report that there is an unknown variable in line 20 while in fact the error is that *number* is spelt wrongly in line 10.

Another common error that reports a wrong line is illustrated by:

```
10 FOR loop = 1 to 5
20 READ number(loop)
30 NEXT
40 DATA 1,2,3,4
```

Although the fault is that either there is a data item missing in line 40 or the loop should only go up to 4 in line 10, this reports that the program is out of data in line 20.

So think about it if you can't see a mistake in the line where an error is reported. See if any of the statements are dependent on other parts of the program.

Remember that if a DEFPROC is followed by a wrongly spelt procedure name, the error will be reported at the line where the procedure is called and not at the actual DEFPROC.

Finally, if you can't spot an error, check that you haven't entered letters like I and O instead of numbers like 1 and 5.

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BBC MICRO
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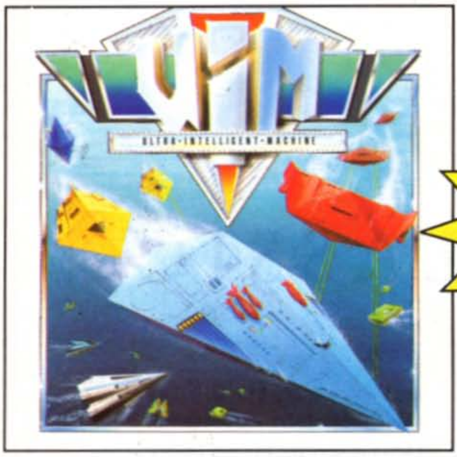
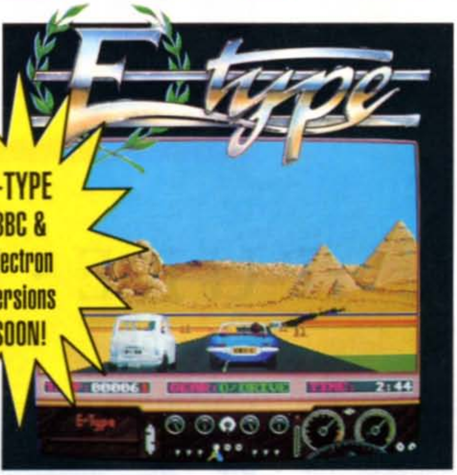
THE 4TH





E-TYPE
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U.I.M.

U.I.M. is a massive 3D arcade adventure set in the future. 2½ years of dedicated design and programming have produced this massive game.The "greenhouse" gases melted the icecaps and all life now exists in the oceans. There are over 65000 underwater ports each with their own colonies.

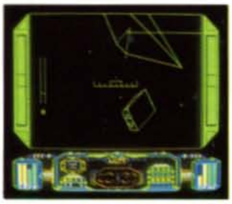
You must travel the oceans, trading in commodities, shares and currency. There are over 250 missions to complete before you will find your goal - the U.I.M. - created to be almost a god! Your craft is a highly manoeuvrable (and expandable) futuristic submarine named Black Satyr.

On your travels you will encounter many submarine types. Many of the most advanced and aggressive submarines do not appear until you reach later networks of ports. In addition you will also meet the Replicants - man-made underwater machines which have gone "renegade" and are capable of reproduction.

As you progress it is therefore essential to avail yourself of the highly sophisticated range of combat and defensive equipment available. The quest for the U.I.M. will be long and involved, the dangers intense, but the reward priceless!

"Will I keep playing it the way I've played Elite for years? And the answer is YES. Graphics 10, Playability 10, Value for Money 10"............***The Micro User, Nov' 89.***

U.I.M. is disc only and will run on BBC B or B+ with 16K of sideways RAM, BBC Master series and all Archimedes Computers.



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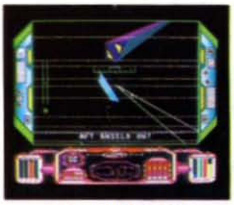

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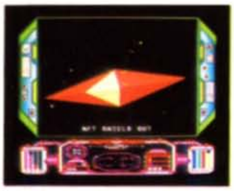

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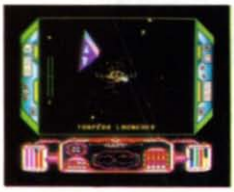

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"E-Type" takes racing simulations into the world of 32 - bit RISC processing and gives you smoother, faster and more detailed graphics than you are even likely to see in the arcades.

E-TYPE

"On the Archimedes the illusion of speed is terrifyingly real and the way the landscape moves in three-dimensional perspective is a joy - a stunning experience".........***The Independent, Dec' 89***

"This is a superb game....the tracks are fantastic".........***The Times, Dec' 89***

"No race game, on any other machine, looks as good".........***The Times Educational Supplement, Dec' 89***

"For challenging races with a real sense of speed and fun, go for E-Type's ignition key".........***The Games Machine, Feb' 90***

"There's just one word to describe E-Type: FANTASTIC! Graphics 10, Value for Money 10".........
The Micro - User, Dec' 89

"The graphics in E-Type are really superb. E-Type in my opinion is probably the best game yet for the Arc"....
Risc User, Dec' 89

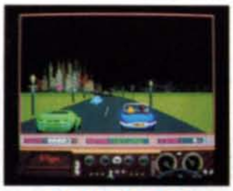
E-TYPE DESIGNER & EXTRA 100 MILES

Design your own "E-Type" tracks with this highly advanced but simple to use designer. It is enormously flexible to produce an endless variety of tracks to challenge you and your friends.

"The perfect complement to E-Type"... ***The Games Machine, Feb'90***

There is also an extra tracks disc featuring extra sprites and 100 miles of cunningly designed roads.

Please note that you will need the original E-Type game to use either the Designer or the Extra Tracks discs.



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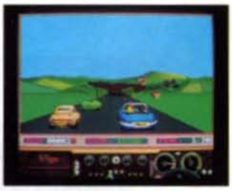

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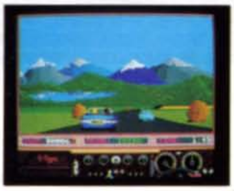

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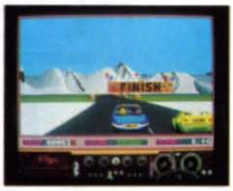


ARCHIMEDES

WHITE MAGIC

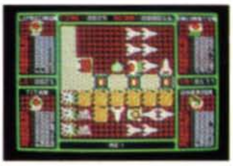
White Magic is a unique arcade adventure in which you control 4 varied adventures:-

Kaldor the Leprechaun, Cheysul the Titan, Moriana The Warrior and Mandrake the Enchanter.

You can transform between all 4 characters at will and use their much needed special abilities.

It features 32 massive action-packed levels filled with aggressive guards and trolls, haunting ghosts and spectres, curious objects to find and use, and much more .....

White Magic is not a game for the faint-hearted; it is a fast-action game which requires fierce hand - to - hand combat and frantic weapon fire.



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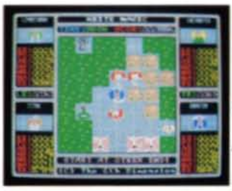

ARCHIMEDES

APOCALYPSE

Produced by Gordon Key, the author of Holed Out and E-Type, this incredible new game sets new standards of excellence in 3-dimensional solid graphics and digitised sound effects. Your overall task is to rescue a whole solar system from an evil dictatorship. Apocalypse is a feast for your eyes, ears and grey matter.

Release date: 5th March, 1990.
See your dealer or ring for your copy today

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Holed Out Extra Courses 2	16.95	11.95	9.95	12.95
Holed Out Designer	19.95	-	-	-

* E-Type BBC & Electron versions due for release 7th May, 1990. All the above Archimedes games will work on the Archimedes A3000, 310 and 400 series

DIMENSION

ARCHIMEDES
BBC MICRO
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Magic
NNING...
Dimension

WHITE MAGIC 2

This includes 32 brand new and highly dangerous levels plus a complete level designer.

The level designer is a doddle to use and can be used to alter or design levels from scratch.

An extra invisible feature in White Magic 2 will really confuse our adventurers!

Reviews of White Magic

"The graphics are superb .... An absolute winner"
Electron User Golden Game August '89.

"Playability is good and I had to tear myself away in order to write this update review."
Archie review - The Micro User, October 1989.

ELECTRON

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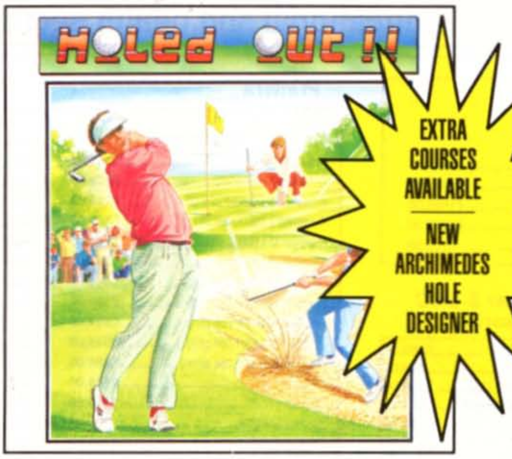

HOLED OUT

The most comprehensive, realistic and highly acclaimed golf simulation on the market today. This volume contains the original 2 contrasting 18 hole courses and comes complete with an easy to follow 16 page manual.

"I play golf and this game is the closest thing I've seen to the real game on a computer". *Archive, June 1989*
"I wouldn't have thought it possible to get a better simulation out of the beeb".
BBC Acorn User, June 1989

"The 3D perspective graphics are stunning"........***Electron User GOLDEN GAME June 1989***

"Holed Out is great ..... The game plays very well and the graphics are superb"..........
Popular Computing Weekly, March 1989

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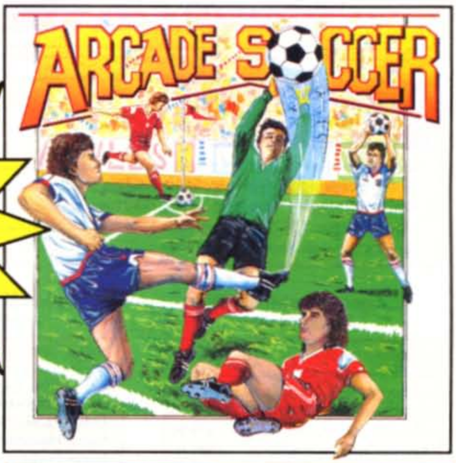

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The Micro User, October "89.

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Compatibility complete

In the final part of the conversion series, John Allen presents a program that transforms Wordwise, Wordwise Plus and Mini Office II files to View or InterWord

IN our January and February issues we published programs to convert files produced by View or Inter-Word to a format that will run in other word processors on the BBC Micro. Now, here's the final program of the set: One which takes a file produced by Wordwise, Wordwise Plus or Mini Office II – saved by the normal save instruction and not spooled or saved as Ascii – and converts it so that it will load into either View or Inter-Word.

Only one program is needed to convert files from all three word processors because their formats are very similar. Text is stored exactly as it is entered, with all formatting, highlights like underlining and italics and other special instructions, stored as embedded commands as part of the text.

Within a Wordwise or Wordwise Plus file each of these embedded commands starts with a byte 02 and ends with either another 02 (if it is immediately followed by a further command), a 07 or a Return (13).

The same bytes are used by Mini Office II except that 03 is used as a terminator in place of 07. These are the commands that can be seen in green on the Wordwise edit screen or magenta in Mini Office II.

Fortunately many of the Wordwise and Mini Office commands are the same and most of those which are only defined in one have equivalents with the same action in the other.

Some of the commands are, however, impossible to decode. For example OC in Wordwise and Wordwise Plus – or CC in Mini Office II – sends raw control codes to the printer. Since it is impossible to know the type of printer, and therefore the effect that these produce, such commands are ignored in the conversion process.

Generally OC or CC are used as a way of printing highlights, so in Wordwise Plus it is best to use DS, DE, US and UE, as these can be translated. Likewise, if you have the BBC Master version of Mini Office II use DS, IT and UL.

As with the previous programs in the set, the conversion will not be complete in every detail, but it covers the cases that are generally encountered.

In particular you should note that anything which involves Wordwise Plus segments or variables will cause an error. Otherwise the main feature which is not converted are the headers and footers – these have to be added to the resulting text in the new word processor's editor.

The new file will, however, conform to the page layout set in Wordwise, and if there are no settings in the file it will use its defaults. Inter-Word can only have one page layout per file, and this is determined from the first definition of each margin as it appears in the file, or the default margin for any that are not defined. Continuous output is used as default.

Both View and InterWord store their text in roughly the form in which it is to be printed, with rulers to determine the line layout. These do not exist in the word processors that this program converts from, so a range of embedded commands set the left margin, indents, tabulation positions and page width.

These commands are translated into rulers by the conversion program, but a new ruler is generated every time one of these commands is encountered.

This means that if, say, the left margin and the line length are changed straight after each other, two new rulers will be generated. The output will not be affected, but the first of these rulers is not acted upon and, for clarity, can be deleted when editing in the new word processor.

The three conversion programs should solve most of the problems involved in passing documents between different users of the BBC Micro. You'll certainly find them handy when writing things for other people which are required as a file for a different word processor to your favourite.

Wordwise	Min-Ofice II	View
BP	BP	PE
BSn	BSn	change margins
CE	CE	CE
CI	CI	new ruler without indent
CO	PO	PB OFF
CPn	CPn	PEn
DT<str>	DT<str>	a new ruler with different tabs
EP	EP	PB ON
FI	IR	RJ
FP	FP	change margins
HP	HP	change margins
INn	INn	new ruler with indent
LLn	LLn	new ruler with different right margin
LMn	LMn	new ruler with different left / right margins
LSn	LSn	LS(n-1)
PLn	PLn	PLn
SPn	SPn	n blank lines in text
SS	SS	LS0
TIn	TIn	n spaces in text
TSn	TSn	change margins

Also, Wordwise Plus and Mini Office II (Master only) bold and underlined highlight commands are translated.

Commands that are translated to View

Wordwise	Mini Ofice II	Inter-Word
BP	BP	unconditional page break
CE	CE	text centred
CPn	CPn	conditional page break
DT<str>	DT<str>	new ruler with different tabs
INn	INn	new ruler with different left margin
JO	FJ	full justification turned on
LLn	LLn	new ruler with different right margin
LMn	LMn	new ruler with different left / right margins
NJ	RR	full justification turned off
PP		page number inserted into text
SPn	SPn	n blank lines in text
TIn	TIn	n spaces inserted into text

In addition, Wordwise Plus and Mini Office II bold and underline highlights are translated, as well as Mini Office II's italics. The first occurrence of each of the margins at the top and bottom of the page, line spacing EP (to enable paged output) are used to determine the page layout in InterWord.

Commands that are translated to Inter-Word

```
   10 REM Wordwise and Mini Office II to
 Inter-Word and VIEW converter
   20 REM by John Allen
   30 REM(c) The Micro User
   40 DIM trule%(50)
   50 DIM W% 256
   60 title$=CHR$(132)+CHR$(157)+CHR$(13
1)+CHR$(141)+" Wordwise and MO II Conver
sions"
```

Turn to Page 128 ▶

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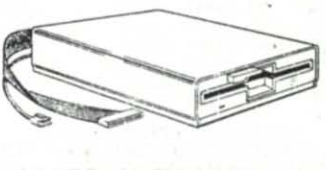

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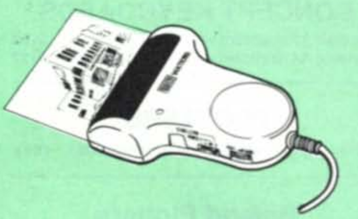
Archi Mk II Hand Scanner



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desk top publishing system. The package includes the most comprehensive utility software available for the Archimedes, a high quality, ergonomically designed to fit the shape of your hand, (see drawing above) scanner, which is fitted with a warning LED that will indicate if the scanner is being moved too quickly for accurate results. Additional twin guide rollers ensure precise tracking over the image, to make the best use of the high resolution available with this sytem. The yellow/amber illumination of our Mk II scanner, enables you to achieve optimum accuracy. It is capable of scanning upto an amazing 400 DPI. The scanning area is 4" wide and the height is only limited by the maximu amount of memory available.

On board ROM software supplied, is the most sophisticated Archimedes scanner software yet written.

Launch offer £149 (P&P £4)

SPECIAL DISCOUNTS

For Teachers, Lecturers & Education.
Please phone for further details.

Z88 Portable Micro

Only: **£195** (Carr £4)

FREE

With every Z88 purchased from us, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

ACCESSORIES

32K RAM Pack or 32K EPROM Pack	£18.00
128K RAM Pack or 128K EPROM Pack	£45
512K RAM Pack	£175
Z88 Eprom Eraser Unit	£35
Z88 Spellmaster for Pipedream	£51
Z88 Carrying Case	£9
Z88 Computing Book	£9.95
AA Nicad Rechargeable Battery	£1.50
Battery Charger Compact & Fast	£6
Z88 Serial Printer Cable	£9
Z88 Parallel Printer Cable	£25

● Z88 to BBC Link	£20	● Z BASE	£56
● Z88 to PC Link II	£30	● Z TAPE	£42
● Z88 to Macintosh	£52	● Z TERM	£42
● Z88 Mains Adaptor	£9	● Z88 Modem	£149

By popular demand, we are now supplying refurbished and fully guaranteed BBC Micros with Disc Filing System

(Please telephone for price & availability)

FINANCE AVAILABLE

In these days of expensive borrowing, we are pleased to have negotiated a special low rate finance deal for our customers, with flat interest rate of 12.25% per annum, typical APR 25.5%.

In addition to the above, we are able to offer all Archimedes and BBC Master computers as well as selected hardware on a 0% interest free finance deal.

For further details please telephone:
0923 37774 ext 223/203/201.

Archi Graphic Tablet

This package allows Archimedes users to take advantage of the low cost graphpad (sometimes called a digitiser tablet, but not to be confused with a video digitiser!)

The Archi Graphpad offers performance and accuracy comparable to other graphics tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely.

The software, which is in the form of a relocatable module (RM), intercepts the system calls which control the mouse, and so allows virtually all mouse based Archimedes software to be controlled using the tablet without any modification. The only exceptions are programs which use the serial port, as the tablet is physically connected to this port itself.

Graphics programs such as Artisan, Pro Artisan, AutoSketch, Oak DTP, and the RiscOS Draw, Paint and DTP packages are considerably enhanced by the use of the graphics table as opposed to the mouse, although it can, of course, be used with any other mouse driven application.

The software allows the user to define how much of the tabler's 12" x 12" working area to use, allowing very fine control when drawing freehand or tracing from a variety of differently sized drawings, diagrams, photographs, etc.

The tablet driver is compatible with all Archimedes machines, and with both Arthur and RiscOS operating systems.

The pointer is moved via a four button puck complete with transparent lens and crosshairs for optimum accuracy. Three of the buttons emulate the Archimedes mouse buttons precisely, the fourth being used for special functions such as setting the position and size of the active working area. The buttons may be remapped to allow the relationship between tablet and mouse buttons to be redefined, should this be required.

The software is supplied with a special adaptor lead to connect the tablet to the Archimedes' serial port, and a power lead which plugs onto the Archimedes' main board.

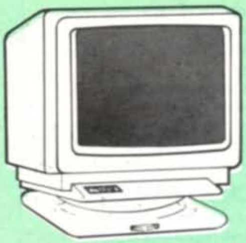
Special Price £249 (carr. £4)

(Price includes Tablet, Leads & Software)

Stylus Optional Extra **£29**

Continued→ → → → → → → → → →

MONITORS



12 months FREE maintenance on site

MICROVITEC 14"

● **1431** – Standard resolution as used on the BBC television computer programme	£175
● **1451** – Medium resolution, suitable for word processing in mode 0	£219
● **1455** – MS Medium resolution, ideal for Archimedes	£220
● **1441** – High res, exceeds the capabilities of the BBC Micro	£359
● **1431AP** RGB + PAL and AUDIO	£199
● **1451AP** RGB + PAL and AUDIO	£255
● **2030 CS** 20" Med Res	£380
● **2040 CS** 20" Hi Res	£675
● Dust Cover for Microvitecs	£5.50
● **Touchtec 501 Touch Screen**	£239

14" MULTISCAN COLOUR

● **TAXAN** Multisync 770 Plus	£389
● **TAXAN** 770 LR Low Radiation, auto-scanning Ultra High Res	£429
● **TAXAN** Multiscan 870 16" Monitor	£575
● **TAXAN** Viking 19" Paper White, High Resolution (1152 x 896 with Archi 400 series)	£799
● **EIZO** 8060H – For technical info. read the review in Micro User, Jan. '89	£389
● **EIZO** 9060SZ Low Radiation, Super High Resolution, Antistatic screen, multiscan monitor for a wide range of applications. 800 dots x 600 lines. Display for high res VGA. 0.28 Dot pitch	£469

TAXAN 12"

● Super Vision 3 – **Type 625** Super Hi-res RGB Colour, Green/Colour Switch	£269

PHILIPS

● **BM7502** 12" Hi-res Green Monitor	£70
● **BM7522** 12" Hi-res Amber Monitor	£71
● **CM8833** 14" Med. Res Colour Monitor	£215

STAR BUY

- **PHILIPS 14"** Medium Res, dark glass, attractively finished Colour Monitor – supplied complete with RGB, SKART and Audio/Phono Inputs. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require).

ONLY £189

Dust Cover for Philips Monitors	£6

(Securicor carriage on Monitors £7)

SWIVEL BASES

By simply placing your monitor on one of our front adjustable professional swivel bases (see drawing at the top), you can easily adjust the monitor viewing angle.

for 12" Monitors **£8** (carr. £2.50)
for 14" Monitors **£12** (carr. £2.50)

Anti Glare VDU Screen

These extremely effective, easy to install, 12" & 14" VDU screens eliminate harmful glare, improves contrast on colour monitors. Increases productivity in offices. A must for wordprocessor users.

Price £12

SPARE LEADS

BNC Lead for Zenith or Philips	£3
Skart Monitor Lead	£5
RGB lead for TAXAN Monitors	£3
Archimedes Colour Monitor Lead	£7.50

CONCEPT KEYBOARDS

Standard A3 Keyboard with BBC Software	£143
Standard A4 Keyboard with BBC Software	£117

PLOTTERS

● Plotmate A4S	£379	● Plotmate A3M	£549

Roland Plotters

(Official Roland Appointed Distributor)

● **DXY 880A**	£499	● **DXY 1100**	£595
● **DXY 1200**	£835	● **DXY 1300**	£1015

Panasonic KX-P1081

12 months FREE maintenance on site

SALE OFFER only: **£127**

(Price includes, FREE a 4ft Printer Lead, and a Dump Out 3, Screen Dump ROM worth £35 with every printer purchased from us)

KX-P1180 Printer Offer

Panasonic KX-P1180 printer, Dump Out 3, Screen Dump ROM & a BBC printer lead.

Offer Price £136

Panasonic Printers

● **KX-P1124** 24pin 80col. 192/63 CPS	£225
● **KX-P1180** 9pin 80col. 144/38 CPS	£146
● **KX-P1540** 24pin 136col. 240/80 CPS	£435
● **KX-P1592** 9pin 136col. 216/45 CPS	£275
● **KX-P1595** 9pin 136col. 288/61 CPS	£355

- **Panasonic KX-P4450i** LASER PRINTER Latest technology at Watford's special offer price **£1,325**

● Spare Toner	£29	● A4 Feeder	£55
● Drum Unit	£149	● Developer	£115
● 1MB RAM Board			£299

Panasonic Accessories

Cut Sheet Feeders

KX-P1592/1595 (P32)	£175	KX-P1540 (P35)	£175
KX-P1124 (P36)	£85	KX-P1180 (P37)	£79

BUFFERS

P12	4K buffer Board for 1081	£55
P42	32K buffer Chip for 1592/1595	£16
P43	32K Buffer Chip for 1540/1124/1180	£16

Serial Interfaces

P17	P1081/1592	£32	**P19**	P1124/1180	£55

Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110	for KX-P1081, 1592 & 1595	£8
P115	for KX-P1180	£8
P145	for KX-P1124	£8
P140	for KX-P1540	£10

Colour Ribbons for KX-P1081, 1592 & 1595
Brown, Blue or Red **£9.95 each**

INTEGREX COLOUR JET

● Colour Jet 132 Printer	£515
● Paper Roll	£6.50
● Screen Dump Software	£10
● Colour Cartridge	£19.50
● Black Cartridge	£11.25
● 100 A4 OHP transparencies	£55
● 8K Serial Interface Optional	£123

Citizen Printer Swift 24 £249

NEC P2200 PINWRITER £225

Pinwriter Serial Interface (optional)	£55
P2200 Cut Sheet Feeder	£59
Additional Font Cartridge	£25

NEC PINWRITER P6/P7 Plus

NEC P6+ 80 columns	£439	**NEC P7+** 136 columns	£575
Colour Option	£74	Serial Interface	£73
Cut Sheet Feeder	£125		
NEC Ribbons for		P6 £8;	P7 £9.50

Hewlett-Packard Printers

12 months FREE maintenance on site

HP Quiet Jet Plus	£437
HP Desk Jet Plus	£549
HP Paint Jet Colour	£719
HP LaserJet Series IIP	£855
HP LaserJet Series II	£1275
HP Laserjet II TONER	£85
1Meg Ram Add-on Laser Jet II	£349
1Meg Ram Add-on Laser Jet IIP	£275

Star Printers

LC10 Printer	£136	XB24-10 Colour	£410
LC10 Colour	£195	LC10 Ribbon Colour	£5
LC24-10 Printer	£215	XB24 Colour Kit	£35
NB24-10 Printer	£399	Cut Sheet Feeder	£55

EPSON PRINTERS

EX800	£429	LQ860 Colour	£510
EX1000	£564	LQ1050	£575
FX850	£315	LQ1060	£649
FX1050	£405	LQ2550+	£925
FX1060	£679	LX400	£132
GQ3500 Laser	£999	LX850	£195
LQ400	£198	SQ850	£490
LQ850	£459	SQ2550	£925
LQ550	£269		

CUT SHEET FEEDERS for

EX800/FX800/850/LQ800/850	£130
FX1000/LQ1000/1050	£175
LQ2550	£390
LX400/800/850/LQ400/500/550	£69

TRACTOR FEED for

LQ800 **£44**; LQ850/FX850 **£69**; LQ1050/FX1050 **£85**; LQ2500 **£90**; LQ2550 **£90.**

ACCESSORIES

● EX800/1000 Colour Option	£55
● EX800/1000 Colour Ribbon	£14
● LQ2500 Colour Option	£65

(Securicor Carriage on Printers £7)

EPSON PRINTER INTERFACES

All these interfaces fit inside the printer

RS232	£32	RS232 + 2K Buffer	£52
IEEE 488	£40	RS232 + 8K Buffer	£79

PRINTER LEADS

BBC Centronics 4' long	£5
BBC Centronics 6' extra long	£7
Compact's Special Centronics Lead	£7
Archimedes Printer Lead 1 metre	£6
Nimbus Centronics Lead	£6
IBM Parallel Lead 1 metre	£6
Double Ended 36 way Centronics Lead 4'	£7
Double Ended 36 way Centronics Lead 6'	£9
MSX Centronics Parallel Lead 4'	£12
RS232 Leads (Various)	P.O.A.

Listing Paper (Perforated)

● 1,000 Sheets 9.5" x 11" Fanfold Paper	£7
● 2,000 Sheets 9.5" x 11" Fanfold Paper	£11
● 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold	£19
● 1,000 Sheets 15" x 11" Fanfold Paper	£9
● 1,000 Sheets true A4 Fanfold Paper 70gms	£11
● 2,000 Sheets true A4 Fanfold Paper 70gms	£19
● Teleprinter Roll (Econo paper)	£4

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

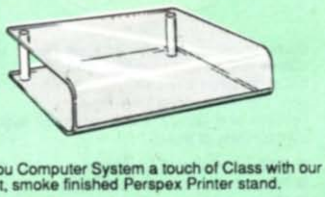
PRINTER LABELS

(On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	**£5.00**
1,000 90 x 36mm (Twin Row)	**£4.90**
1,000 90 x 49mm (Twin Row)	**£7.50**
1,000 102 x 36mm (Twin Row)	**£6.25**

Carriage on 1,000 Labels £1.00

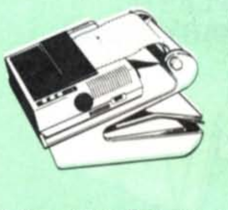
Perspex Printer Stand



Give you Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version	**£16** (carr £3)
136 Column version	**£20** (carr £4)

Professional Printer Stand



This new professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and refold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Additional facilities include: Easy access to paper from both sides, used with both top and bottom feed paper and with its dial controlled paper feed system with adjustable deflector plates it ensures smooth paper flow and automatic refolding.

80 Column version £23 (carr. £3)

132 Column version £26 (carr. £4)

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
Brother HR15/20	£3.00	–
BBC Micro	–	£3.50
BBC Master	–	£4.00
Archimedes Micro pair	–	£9.00
Citizen 120D	£3.95	£4.50
RX/FX80/MX80	£3.00	–
DMP2000	£3.75	£4.75
EX/LQ800	£4.50	£4.50
EX/LQ1000	£6.75	£5.00
RX/FX80/85/800/MX80	£3.25	–
RX/FX100/1000	£5.00	–
Kaga/Taxan KP810/815	£4.90	£5.00
LQ500/550/800/850	£4.50	£6.00
LQ1050/LQ2500	£7.00	£5.50
LX80/86/800/850	£3.25	£4.50
M1009/GLP	£3.80	£3.75
NEC P2200	£6.00	£5.00
Panasonic KX1080/81	£3.50	£4.75
Panasonic KX-1124	£8.00	£5.00
SQ2500	£23.00	£5.50
Star LC10/NL10	£4.25	£5.00
Star LC24-10	£5.00	£6.00
Olivetti Ink Jet Cartridges (set of 4)	£9	

Our attractive Dust Covers are manufactured from translucent PCV. The seams are stitched and edges are taped to prevent splitting due to continuous use.

Universal Printer Sharers/Changer

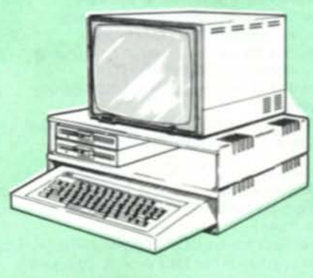
Connect upto 5 Micros to 1 printer or 5 Printers to 1 Micro with our combined, Sharer/Changer. These Units are made to a very high standard. For extreme reliability, they all have Printed Circuit Boards mounted inside the case, (not a Spaghetti Junction of wires). Internal connection is made via high quality ribbon cables.

(Ideal for School environments)

Connects	Serial	Centronics	P&P
2 to 1	£20	£22	£3
3 to 1	£27	£30	£3
5 to 1	£36	£39	£4

(Cables extra at £6 each. Please specify type required when ordering)

PLINTHS FOR BBC MICRO, MASTER & PRINTERS



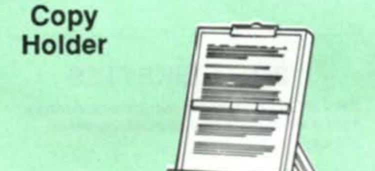
Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationary. The computer slides neatly in the lower section allowing easy access to remove the lid.

The single printer stand is equally sturdy but instead of cooling slots it has elegant cutouts on the sides. This allows easy access to paper from all sides. Colour: BBC Beige.

Single BBC Plinth	420 x 310 x 105mm	**£13**
Double BBC Plinth	420 x 310 x 210mm	**£24**
Printer Plinth	420 x 310 x 105mm	**£12**
Single Master Plinth	490 x 310 x 105mm	**£14**
Double Master Plinth	490 x 310 x 210mm	**£26**

(Carr. Single plinth £2; double plinth £3)

Copy Holder



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding you paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip. (for resting books or magazines, the desk top version is recommended).

Desk Top **£7** (carr. £3)

Angle poise **£12** (carr. £3)

Handy Printer Switch

A handy two way compact printer switch that enables you to connect 2 Micros to 1 printer, or 2 printers to 1 Micro. Attaches easily to your printer, monitor, etc. A low cost solution for educational establishments. Ideal for those wishing to use a dot matrix and a laser printer. Available in two configurations.

Compact AB Switch Centronics	£19
Compact AB Switch RS232	£18

(Cables extra at £6 each)

MEGABUFFER 256

The Smallest 256K Printer Buffer Unit in the world **38mm x 130mm x 134mm.**

This new Megabuffer 256 from Watford is a full featured 256K Printer Buffer. The features are:

- Improves efficiency by making more efficient use of computer and printer.
- Compatible with any computer and printer that uses Centronics Parallel connections including all BBCs, IBM PCs, etc.
- Total compatiblity with all software.
- Cheaper phone bills when using your Modems.
- Ideal for those doing large graphics screen dumps that are slow to print.
- Multi-Copy facility allows you to print several copies via Megabuffer without going through your computer.
- Data Dump facility is included.
- Built in text unit for both the buffer & your printer.

Only £119 (carr £5)

Payment may be made by credit card, Connect card or cheque, but we also have available a range of finance terms, see the feature in our advert.

THE EPSON RX-FX-KAGA
Printer Commands Revealed

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you are with all sorts of printouts to show its capabilites – he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out? Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

It describes in detail how to obtain the maximum in graphics capability from your printer and includes full indexes allowing you to cross index the numerous commands. Every command is explained in detail, with an accompanying BBC Basic program and an example of its use from Wordwise.

£5.95 (No VAT)

CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

Continued→ → → → → → → → →

Archimedes Real-Time Digitiser

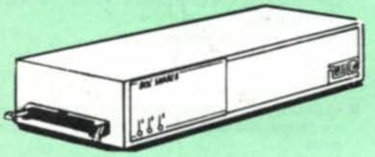
Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £249

A Set of Colour Filters for colour image grabbing using a video camera	£16
New Risc-OS Software Upgrade	£39

DISC DRIVE SHARER

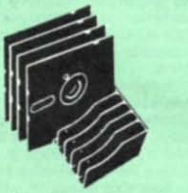


(Ideal for educational establishments)

At last, a low cost alternative to the Econet system.Watford's Intelligent Disc Drive Sharer allows you to connect 3 BBC micros (model B, B+ and Master series) to a single or double disc drive. Running under any DFS or DDFS, this intelligent unit will automatically queue the computers. Each computer has a status light dedicated to it. If it is green you will get immediate access to the disk, and red means that you are next in line. The unit plugs directly into the disc drive socket on each computer and is powered by the mains. (N.B. Not for use with ADFS.)

Launch Price : **£65** Price includes 3 Cables

DISC PLONKER RACK



When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the harzards of fingerprints, scratches, dust, coffee and an untidy desk.

Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: **£2**

Acorn & Watford DFSs

Watford sophisticated DFS ROM	£16.00
Watford DFS Kit complete	£69.00
We will exchange your existing ROM for Watford's ultimate DFS ROM at only	£12.00
DFS Manual (comprehensive)	£6.95
Acorn DNFS ROM	£17.00
Acorn ADFS ROM only	£25.00
Acorn 1772 DFS ROM Kit	£49.00

(The single Density DFS system is now old technology. Like Acorn, Watford too have decided to replace it with the their more up-to-date 1770 DDFS interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

Watford's MkII 1772

Single/Double Density DFS

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1770 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1770 DFS, plus the added features.

Added features include:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Tube host Code – No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches (even works with protected disks).
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Fits with all third party ROM boards.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.
- OSGBPB has been recoded, increasing still further the speed of file handling.

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk – Ours allows both of these!

If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII version, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only **£39.00.**

SPECIAL PRICE	£44.00
DDFS Manual	(No VAT) £6.95
We will exchange your existing DFS Kit for our sophisticated DDFS for only	£30.00

Please note, as the MkII DDFS is a hardware and sofware upgrade, it is not possible for existing Watford DDFS users to simply exchange the ROM for the new version.

DUST COVERS (For our Disc Drives)

Single CLS (without PSU)	£3.20
Single CS (with PSU)	£3.25
Twin CLD (without PSU)	£3.85
Twin CD (with PSU)	£3.90

3M – DISKETTES

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electonics your 3M Appointed Distributor

10 x 5.25" S/S D/D 40T (744)	*£5*
10 x 5.25" D/S D/D 40T (745)	*£7*
10 x 5.25" S/S D/D 80 Track (746)	*£8*
10 x 5.25" D/S D/D 80 Track (747)	*£9*
10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT	*£14*
10 x 3.25" S/S D/D 40/80 Track	*£9*
10 x 3.25" D/S D/D 40/80 Track	*£9*
10 x 3.5" Double Sided High Density	*£22*

TOP QUALITY 3.5" & 5.25" DISKETTES

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

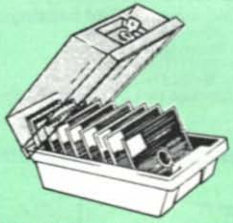
*10 x **M3** 3.5" D/S D/D 80 Track*	*£9*
*10 x **M9** 3.5" D/S High Density*	*£22*
*10 x **M4** 5.25" S/S D/D 40 Track*	*£5*
*10 x **M5** 5.25" D/S D/D 40 Track*	*£7*
*10 x **M7** 5.25" D/S D/D 80 Track*	*£9*
*10 x **M8** 5.25" D/S H/D Hi-Density*	*£13*
***M2** 3" Double Sided*	*£3 each*

FLOPPY HEAD CLEANER KIT

The heads in floppy drives are precision made and very sensitive to dirt. The use of cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

ANTISTATIC LOCKABLE DISC STORAGE UNITS



Gives double protection – Strong plastic case that affords real protection to your discs.

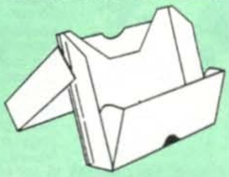
Antistatic helps avoid data corruption whilst in storage. The smoked top locks down.

Dividers and adhesive title strips are supplied for efficient filing of discs.

M35 – holds up to 50 5.25" discs	£4.95
M85 – holds up to 95 5.25" discs	£6.95
M25* – holds up to 25 3.5" discs	£4.95
M50 – holds 50 3.5" discs	£6.50
M10 – holds 8 of No. 10 Data Cartridges	£15

* Not lockable

PLASTIC LIBRARY CASES



Holds up to 10 5.25" Discs. **Only £2.00**

DISC ALBUMS

Attractively finished in black leather-look vinyl. Stores up to 20 discs. Each disc can be seen through the clear view pocket.

£4

Special BULK OFFER on 5.25" DISCS

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)

PRICES SLASHED

BULK PACK DISCS in lots of 100

Type	S-S 40T	D-S 40T	D-S 80T
Without Sleeves	£30	£35	£40
With Sleeves	£33	£38	£43

Quality Disc Drives from Watford

To help you decide which drive is the most suitable for your needs (and your pocket!), we have produced the table below.

This 30 Megabyte hard disc is completely compatible with the Acorn ADFS – that's why we have bundled it with each Winchester drive, along with an Utilities Disc.

The tinting on some of the boxes is used to indicate which Drives are 40 track (non-tinted) and which are 80 track (tinted). All our 80 track drives are already fitted with a 40-80 select switch.

***All our Disc Drives are Double Sided and will operate in both Single and Double Density modes.** Extensive experience of the usage of disc drives suggests that the JAPANESE drives currently represent about the best in terms of speed, reliability and overall "elegance" available for the BBC Micro.*

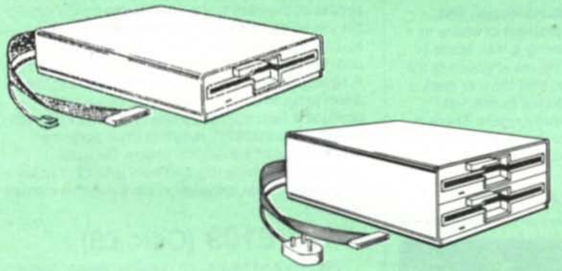
Various UK "manufacturers" of disc drives for the BBC micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high qulity NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public. If you look around the popular BBC micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, some of the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

*Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. **Ideal for Schools & Colleges.** We are now able to supply all single disc drives with Power Supply, in either single or dual case. (Dual case has a twin data cable and a power supply capable of driving two disc drives) allows easy expansion to a dual drive unit, at a later date. Prices stated in the pricing boxes below are for single drives in standard single cases. Single drives in a dual case cost an extra £18. (At Watford we anticipate your needs of tomorrow, not just today!)*

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space) your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the 4th page of our advert for the Plinths).

P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is the special Compact Disc Drive Cables designed by us.

Our Disc Drives conform to BS415



"Test Bureau Approved for Use in Education"

Capacity	Drives without P.S.U.		Drives with P.S.U.	
	Single	Twin	Single	Twin
400K (720K)	CLS400S £75	CLD400 £168	CS 400S £85	CD400 £188
800K (1,44M		CLD 800S £153		CD 800S £163

- TWIN Disc Drive Case, complete with Power Supply & Cables **£43**

Securicor carriage on Disc Drives £6 to £7

Prefix ***C** = Cased Drive*
***L** = Less PSU*
***S** = Single*
***D** = Double*

Suffix ***S** = 40-80 Switchable*

e.g. CLS400S = Cased Disc Drive, Less power supply unit, single 5.25" 400K, (720K in double density); Double sided; 40/80 track switchable.

Cable to connect 5.25" Disc Drives to BBC Compact
Single £9 Twin £12
Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

Special 40/80 Disc Drive/DDFS Mk II Offer

- The popular 40/80 track 400K single Disc Drive, Double Sided, cased with Cables. Plugs directly to your Micro.
- Watford's extremely popular DDFS Disc Interface (allows 720K storage). Will run in both Single & Double Density modes.
- A comprehensive User Friendly Manual.

A Bargain at Only **£119** (£7 carr) (Offer valid while stocks last)

3.5" DISC DRIVE OFFER

These top quality 3.5" Double sided, 80 track, 1 Megabyte (unformatted each Disc Drives), are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Drives to connect to BBC Micros own PSU

CLS35 400K Unit	**£65**	**CLD35 Twin 800K**	**£119**

Drives with built-in Power Supply Unit

CS35 Single 400K	**£85**	**CD35 Twin 800K**	**£129**

(P.S. CS35 Single is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage).

WATFORD's WINCHESTER DRIVES

Undoubtedly the best value for money Winchester Hard disc available anywhere for the BBC Micro.

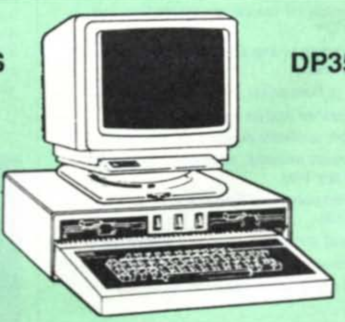
This 30 Megabyte hard disc is completely compatible with the Acorn ADFS – that's why we have bundled it with each Winchester drive, along with a Utilities Disc.

Finished in rugged metal and fetching BBC beige, the Winchester has an internal fan, so quiet you won't even hear it! A switched mode power supply and a neon-lit on/off switch are there along with a light on the hard disc to tell you when it is working – just compare the price with our competitors' 20 or 28 Mbyte discs!

Compatible with the Master, and the BBC B (with 17 X disc interface).

- 30 Megabyte BBC Hard Disc **£369** (carr £9)

CDPM 800S



DP35-800S

Twin 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC Micro. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

CDPM 800S for the BBC B & Master £175

A Double disc drive with a difference! Times are changing fast for the floppy disk, and whilst the current standard for the BBC B and Master series is the 5.25" disk, the standard of the future will most certainly be the smaller; faster and more reliable 3.5 inch disks – now a standard feature of both the Master Compact and the Archimedes Series.

To support the present disc drive users, and cope with the future, we have designed our own plinth-mounted disk system – called the DP35 800S. It contains both the 5.25 inch and the 3.5 inch drive formats as well as offer a firm and rigid support for a monitor on top. With the BBC Micro underneath, the plinth makes a surprisingly small footprint on the desk – leaving you more space to work with.

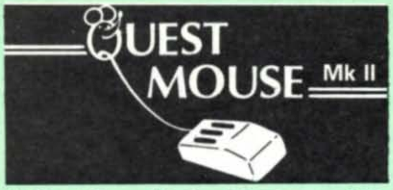
The 5.25" disc drive is 40/80 track switchable. DP35-800S has its own power supply, independent of the BBC Micro.

DP35-800S for BBC/Master £165

(Securicor Carr. £7)

(The above drive units are 2 Megabytes unformatted)

Continued→ → → → → → → → →



● Quest Mouse II & Quest Paint	£58
● Quest Mouse II, Quest Paint, AMX Stop Press & Pagefont	£89
● Quest Mouse II only	£29
● Quest Paint Software only	£34
● Quest Font Disc (22 Text Fonts)	£15
● Quest Mouse Mat (Red or Blue or Green please specify)	£3
● Part Exchange your unreliable AMX Mouse for a Quest Mouse for only	£22

(P.S. Quest Paint is not compatible with BBC Compact)

Winner of the BBC Acorn User 1990 Award for the Best Art/ Graphics software

ConQuest

Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

Some of the features are:

- *Pick filenames off the screen for loading and saving.*
- *Rotate a cutout to any angle and Distort it to any four sided shape.*
- *Has Built in Font editor.*
- *Default brushes and patterns on startup.*
- *16 x 16 font available on start up.*
- *Ability to reset patterns, fonts and brushes to default at any time.*
- *ROM based enhanced Epson and compatible printer dump.*
- *ROM based enhanced extended picture routine.*
- *Ability to create and abort extended pictures.*
- *Improved disk access speed for extended pictures.*
- *User definable sideways RAM driver for incompatible sideways RAM systems.*
- *Ellipses at any angle on Master 128 (or B with GXR ROM).*

ConQuest ROM Package £30
(Price includes software in ROM and a comprehensive Manual).
(Not Compatible with BBC Compact)

NEW

ARCHI Mk II MOUSE

An extremely reliable replacement mouse for Archimedes Micro £39

RB2 Marconi
TRACKER BALL

RB2 (AMX/Quest compatible)	£45
RB2 including Quest Paint	£75
RB2-A for Archimedes	£52

THE NEW Mk III AMX MOUSE

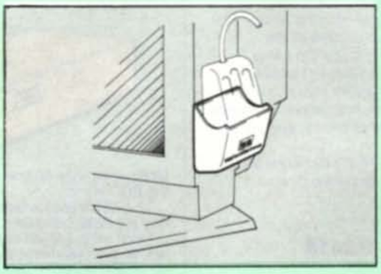
Inc. Super Art package

ONLY: £59 (carr £3)

(Please specify for BBC, Master or Compact)

MOUSE MAT	£3
AMX MOUSE ONLY	£29
AMX SUPERART Package	£34
AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse	£32
PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker	£13
AMX DESIGN (ROM)	£55
AMX XAM Educational	£15
AMX EXTRA EXTRA	£16
AMX MAX A gem of desktop (ROM)	£20

WE MOUSE HOUSE



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive or desk. It protects it from damage when not in use, yet within easy reach when you need it again. There is also a second compartment for your pens and pencils – and at £4 it doesn't cost a rodent's ransom.

Price £4

Our Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted. (Price includes FREE software Disc and Operating Manual)

Only £21

FLEET STREET EDITOR

Software pack for BBC Micro	£33
Software pack for the Master	£39
Admin Xtra Disc Utility	£13
Walt Disney Disc Utility	£13
Fonts N Graphics Disc Utility	£13

BEEB
VIDEO DIGITISER

"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro.

This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket.

Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

Both the black and white levels can be adjusted manually for the optimum picture, or switched to automatic for unattended use. The image produced can be reversed if necessary.

Full controlling software is supplied on a normal sideways ROM and this is easily accessed via additional ★ commands. The package is designed to allow easy input of complex screens and give full access of the data to the user. Once on the screen, the image can be used as a normal graphics screen, allowing any of the usual graphics commands in BASIC or other ROMs to work on it.

A special print dump routine is included with the driver programs. This is specially designed to produce a fast, correctly proportioned picture, with reduced "contouring", resulting in an accurate reproduction of the original image. Detailed examples of driving this unit from BASIC or other languages are all provided in the extensive manual supplied.

£109 (Carr. £5)

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

Magazine Maker
(As seen on TV)

A combination of Stop Press and Watford's Beeb Video Digitiser.

Using any video that provides a composite signal and the digitiser, images from a camera or TV can be converted into a graphics screen on the BBC Micro.

They can then be used within Stop Press to illustrate magazines or newsletters – in fact anything that needs to be created on A4 size paper.

With Stop Press's many features, a variety of pictures can be composed – the only limit being the imagination.

Pictures can be doctored using Stop Press's graphics option to produce any number of effects.

Text can be formatted around the digitised photo on screen using the facilities available, which include 16 typefaces, character and pattern definer, text formatting and the ability to load in Wordwise and View files plus much more.

Once created the picture can be printed out.

The Magazine Maker is suitable for any use that requires illustrated documents.

Complete Package **£135.00** (carr. £3)

WAPPING
EDITOR
"MIGHTIER THAN THE QUILL"

Winner of the BBC Acorn User 1990 Award for the Best DTP/ Word Processor

The WAPPING EDITOR

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

PAGE LAYOUT SECTION

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module is a mode 0 version of the highly acclaimed Quest Paint package, and incorporates all the same drawing facilities, e.g. pencil, brush, airbrush, polygon, circle, ellipse, fill, cut-and-paste, etc., etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be – it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

WORD-PROCESSOR

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

cont./-

THE FONT EDITOR

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individully proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.

Upgrading to the Wapping Editor could not be easier since the font editor will convert fonts from other packages, such as Quest Paint or Stop Press (formerly Pagemaker), into Wapping Editor format and a mode conversion utility will convert any screen in modes 1, 2, 4 or 5 into a full grey-scale mode 0 screen. Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser, either independantly or from within the Wapping Editor package.

Wapping Editor Software Pack	£69
Wapping Editor plus Mouse	£89

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc. Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

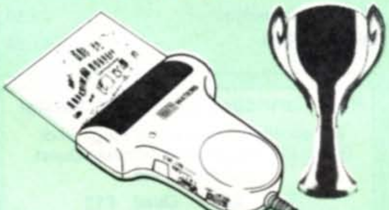
There are two prepared hi-res pages layed out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

The Beeb HandScan

Hand-held Scanner for the BBC Micro



Watford Electronics are pleased to announce the launch of the first hand held scanner for the BBC Micro. HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs! These useful devices have been available for faster and more expensive micros for some time, but only now is Watford Electronics able to offer the BBC Micro computer.

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

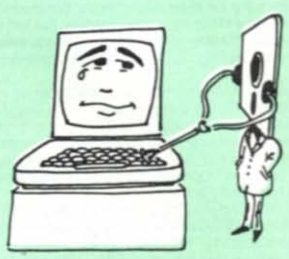
Beeb HandScan & Firmware	£135

Wapping Font Disc

Sixteen Wapping Editor fonts including smaller versions of Oberon and Daisy and two new sizes of the standard font.
Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.
Supplied complete with instructions.

£12

DIAGNOSTICS DISC



The BBC Micro is a very complex machine and thus diagnosing a fault can be very difficult. At Watford Electronics, we realise how difficult it can be when faced with a problem, finding yourself a long way from your nearest dealer, or even just uncertain about your Beeb's health, but not wanting to waste time and money taking it to be looked at.

The solution to these problems is here now, in the form of the Watford's Diagnostics Disc. This excellent utility is specially designed to test out the following areas of your Beeb:

RAMs, ROMs, ULAs, Sound, Keyboard, Disc, RS423, ADC, User Port, Printer Port, Cassette, Joysticks, Speech, Disc Drives, 6502 and Z80 2nd Processors.

This utility is an invaluable aid for all those who take the reliability of their system seriously. A comprehensive manual provides full operating details and a list of possible causes and remedies for any faults that you may find along the way. The package also enables a permanent equipment and service record to be maintained.

Only £20.00

(Only suitable for BBC B with 8271 DFS)

Payment may be made by credit card, Connect card or cheque, but we also have available a range of finance terms see the feature in our advert.

NEW

Beeb DOS 2.2

The BBC and IBM PC's are the most popular micros in the UK. The BBC is firmly established in the education sector and the IBM is the industry standard in the business world. The pools of information and applications held on these computers are immense, yet the means of passing information between them are very limited. Beeb DOS provides a practical method of transferring information between these two micros.

Beeb DOS is a collection of utilities which run on the PC's and enable it to read and write information on BBC discs. You can transfer files between your PC's 360K floppy, high density floppy or hard disc and your BBC discs. In addition Beeb DOS allows you to catalogue, format and compact BBC discs and delete, re-name, lock and unlock BBC files, all on PC's. Each Beeb DOS utility is written in IBM assembler and is run directly from PC or MS-DOS. The Beeb DOS utility can be run from floppy disc, hard disc or RAM drive.

Beeb DOS is supplied on an IBM 5.25", 360K disc complete with a comprehensive operating manual.
(Will only work on 360K Disk Drives)

Price: £39

(Please write in for technical literature)

Continued→ → → → → → → → →

ARIES CORNER

B-32 Shadow RAM Card

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Cobal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus, Interword and many other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved ★FX call.

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend any operating system buffer (such as th printer buffer) or to load tape programs into a disc system.

The B32 simply plugs into the 6502 processor socket on you BBC micro – no flying leads to connect and no soldering. Provision of the onboard ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets.

● Recommended by Computer Concepts for use with their Inter series of ROMs.

Price: **£69** (carr. £3)

Aries B-12 Sideways ROM Board

The B-12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM chips.

If you do not have a B32 or B20, a small adaptor module (the Aries-B12C) is available at a nominal cost

Price:	Aries B-12	**£36**
	Aries B-12C	**£5**

ARIES B-488 IEEE-488 INTERFACE UNIT

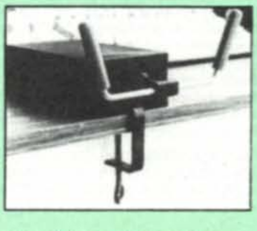
The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

£238 (Carr £3)

VOLTMACE JOYSTICKS

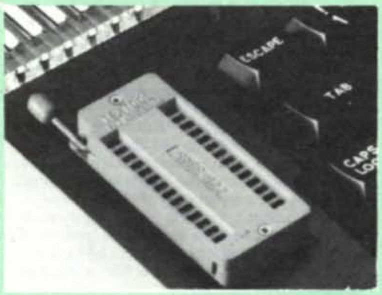
Delta 3B Single Joystick	**£10**
Delta 3B Twin Joysticks	**£15**
Delta 3C Joystick for Compact	**£10**
Delta 14B Single Joystick	**£11**
Delta 14B/1 Adaptor Module	**£12**
Transfer Software Disc-Tape	**£7**
Delta-Cat A mouse eliminator Joystick for the Archimedes	**£24**

Delta Base B



Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128	**£25**

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

● Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.

● The low profile of the socket allows unrestricted access to the Keyboard.

● All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.

● This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for professionals and Hobbyists alike.)

● BBC, B+ and Master compatible.

ONLY **£18** (carr £3)

Low Profile CARTRIDGE SYSTEM

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack for the BBC B.

● Complete System	**£11**
● Spare Cartridges	**£2.50**
● Spare Rack	**£1.50**

ROM Cartridges for the BBC Master

Will accept the new larger Piggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin **£8;** Quad **£12**

16K DISC RAM

(16K Sideways RAM Module)

Complete with such features as read and write protection, these new modules from Watford Electronics are ideal for the hobbyist, software developer and ROM collector.

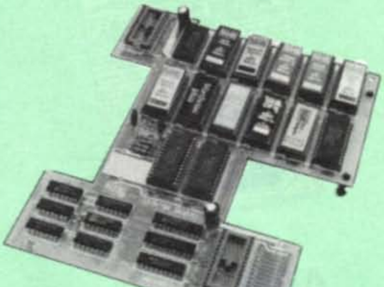
Key points to note about this new addition to the Watford range of products are:

- Write protection (useful in a variety of circumstances)
- Compact construction
- Supplied complete with Battery Backup.
- No overheating or overloading problems.
- Free utilities disc supplied
- Can be used as a 16K PRINTER BUFFER.
- Ideal for profressional software development.
- Supplied with utilities software disc.

Only: **£32** (carr £2)

P.S. 16K Disc Ram Board is not designed to work in conjunction with a Sideways ROM Board.

SOLDERLESS SIDEWAYS ROM SOCKET BOARD



The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:

- Increase your BBCs capacity for ROMs from 4 to 16.
- **No soldering required.**
- Very low power consumption.
- Minimal space required.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish") allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £35
Battery Backup fitted **£39**
Battery Backup only **£3**
16K Sideways RAM **£8.50**
(carriage £3)

● Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

FINANCE AVAILABLE

In these days of expensive borrowing, we are pleased to have negotiated a special low rate finance deal for our customers, with flat interest rate of 12.25% per annum, typical APR 25.5%.

In addition to the above, we are able to offer all Archimedes and BBC Master computers as well as selected hardware on a 0% interest free finance deal.

For further details please telephone:
0923 37774 ext 223/203/201.

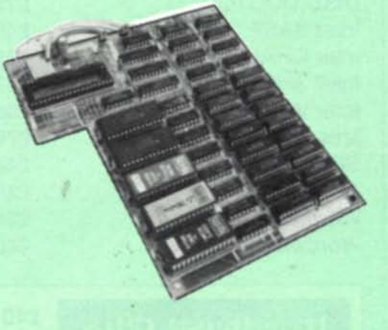
USER PORT SPLITTER UNIT

User Port Splitter
A
B

Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

Excellent Value at **£22** (carr £2)

ROM/RAM CARD



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 7 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, the new Watford Electronics ROM/RAM board. This highly versatile and sophisticated board represents the latest in "2nd generation" sideways ROM technology for the BBC micro, designed to satisfy the serious BBC user.

- NO SOLDERING required to fit the board.
- NO User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM (ALLEVIATES crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- FREE utilities disc packed with software.
- Compatible with our DDFS board, 32k RAM Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

NTRODUCTORY PRICES:

ROM/RAM card with 32k dynamic RAM	£48
ROM/RAM card with 64k dynamic RAM	£65
ROM/RAM card with a massive 128k dynamic RAM	£109

(carriage on ROM-RAM Card £3)

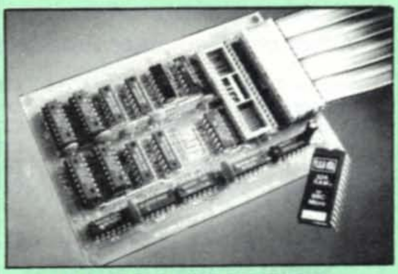
OPTIONAL EXTRAS:

16k plug-in Static RAM kit	£9
16k Dynamic RAM for Upgrade	£13
Battery backup	£3
Read and Write protect switches	£2 each
Complete ROM-RAM board All options installed	£115

P.S.

IS your existing ROM Board overflowing with ROMs? Do you need more Sideways RAM? Is your Board unreliable? Then upgrade to Watford, ROM/RAM Board and pay £5 less.

32K
SHADOW RAM-Printer Buffer
Expansion Board



A MUST FOR WORD PROCESSING

Watford Electronics now brings you the latest state-of-the-art MEMORY EXPANSION BOARD for your BBC microcomputer. Don't throw away your BBC B for a BBC B Plus or BBC Master. Just plug the ribbon cable into the 6502 processor socket, and fit the compact board inside the computer. Immediately you will gain not 16k or even 20k, but a massive 32k of extra RAM!!!

● IMPROVE your WORD PROCESSING system, whether disc or cassette based. Don't wait for a slow printer – type in text while printing. TWO JOBS DONE SIMULTANEOUSLY and £100+ saved on a printer buffer.

● "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28,000 bytes free – 5 times as much as normal.

● In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.

● Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.

● Use the FULL 32k or the bottom 12k of the expansion RAM as a PRINTER buffer for PARALLEL or SERIAL printers, sound channels, RS432 etc. Print large text files while running long graphics programs, and have all your buffer options available as well (*FX15,21,138, 145,ADVAL etc). Please note only a 12k printer buffer can be used with Wordwise or Wordwise-Plus, due to the way they are written.

● Unique facility to turn ROMs off and on again. Unlike all other ROM managers, this feature does not use 'unofficial' memory. Two bytes of normally user-inaccessible memory on the RAM card are used to ensure ROMs are disabled WHERE OTHER ROMS FAIL.

Only £59 (carr £3)
(Price includes a comprehensive manual
and the ROM)

INCREDIBLE WORDPROCESSING DEAL

Watford's 32k SHADOW RAM CARD and Computer Concept's INTERWORD Wordprocessor package.

at Only **£89** (Carr £3)

CREDIT CARD 24 HOUR
Ansaphone Hot Lines
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Acorn Speech Synthesizer
package complete, for the
BBC B Microcomputer
Special Offer **£18**

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Popular Educational Software

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6-8 yrs – Eight programs on Disc, Number Train, Shopping, Maths Maze, Treasure Hunt, Bounce, Packing Caterpillar, 3 Number jump £13.25

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Over 8 yrs – Eight programs on Disc, Build a Bridge, Passage of Guardians, Unicorn, Logic Doors, Souvenirs, Code Boxes, Mystery Machine & Escape. £13.50

Versatile **BEEB SPEECH SYNTHESISER** Unit

Beeb Speech Synthesiser

The Watford Speech Synthesiser is a very flexible speech synthesis unit based upon the powerful phonemes system. This system stores the building blocks of speech (called phonemes) and allows you to combine them quickly and easily to form virtually any word imaginable.

Supplied with an advanced ROM, you are provided with a 500 word dictionary to get you started. These can easily be added to by following the notes given in the comprehensive manual.

SPECIAL PRICE £32 (carr £3)

Continued→ → → → → → → → →

VIEW 3.0 ROM	**£45**
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VIEWPLOT Disc (Please specify for Master 128 or Compact)	**£20**
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OVERVIEW packs 1 & 2	**£65**

Watford's own Sophisticated VIEW PRINTER DRIVERS

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CASHBOOK – A complete "Stand Alone" accounting software package for the cash based sole trader/partnership business. It is designed to replace your existing cashbook system and will provide you with a computerised system complete to trial balance.

FINAL ACCOUNTS – Will take data prepared by the Cashbook module and produce a complete set of accounts as following: Trial Balance with inbuilt rounding routine; Notes to the accounts; VAT Summary; Profit & Loss A/C; Balance Sheet.

MAILIST – A very versatile program. Enables you to keep records of names and addresses and then print, examine, sort and find them, all with special selection techniques.

EASILEDGER – A management aid software tool designed to run alongside an existing accounting system. Essentially a Debit/Credit ledger system which can handle sales, purchase and nominal ledger routines to provide instant management information.

INVOICES & STATEMENTS – Greatly reduces the time and cost of preparing Invoices and Statements by storing essential information like customer names, addresses and account numbers. Has VAT routines and footer messages facility.

STOCK CONTROL – Allows you to enter stock received, stock out, summary of stock items and current holdings together with details of total cost, total stock to minimum level, units in stock ordering, quantity and supplier detail.

All this for only **£21** (Disc)

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- DATABASE
- BEEBCALC SPREADSHEET
- BEEBPLOT GRAPHICS

DATABASE – Set up a computerised card index system with powerful search facilities.

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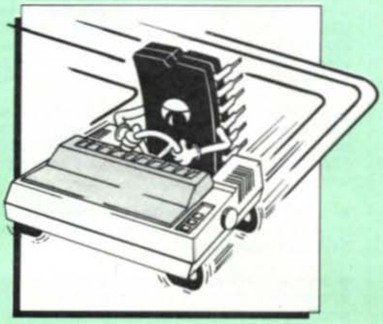
VIEW PRINTER DRIVER ROM



View is a powerful word processor, but until now has seriously lacked in terms of printer support. With the launch of our Printer Driver ROM, which includes an extremely powerful and easy to use Printer Driver Generator, View users can find themselves in the realms of advanced word processing at only a small outlay.

The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, LX, JX80 range, HI80, KP810/910, PW1080, JP101, HR15, M1009, GLP, Panasonic KX-P1081/2, JUKI 6100, etc.

Other printers are readily supported by defining a Printer Driver using the built-in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the features).

NLQ control, Underline, Bold, Proportional Spacing, Microspacing, Italic, Superscript, Subscript, Condensed, Enlarged, Double Strike, Set lines per inch numerically (e.g. LPI 6), Set characters per inch numerically (e.g. CPI 5), Select printer font, Select printer ribbon colour, Translation sequences, Emulation of BBC Character Set, Simple numeric expressions for certain operations, Full printer setup, Send control codes, Print prompt on screen, Redifinable Pad character, Pause for key press, Prompt to change daisywheel, and Execute ★ command when printing.

Other features include a very powerful on-screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory-based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips. (Write in for a detailed leaflet).

Price: Only £33

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COMMUNICATOR	£49
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Wordwise plus £40

We are giving away absolutely **FREE**, the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

Word-Aid

The most comprehensive utilities ROM for Wordwise-Plus

Extend the power of your Wordwise Plus word processor with this most advanced ROM from Watford. By utilising the powerful Wordwise Plus programming language, WordAid provides a whole host of extra features, all accessed via a special new menu option. This ROM has been personally approved by Mr Charles Moir, the author of WORDWISE PLUS.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document.
- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear test-segment area.
- BBC B, B+ and Master compatible.

Only **£24**

(N.B. Word Aid requires a Disc interface in your Micro)

BOOK

The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included. These may be typed directly into the micro, without the need for any understanding of the hardware or software involved, enabling the mouse to be used for custom applications.

Price £5.95 (No VAT)

Example programs on Disc £4.95

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THE COMPLETE BBC COMPUTER USER HANDBOOK

"Why has no-one written a book like this before? It's long overdue".

If you own a BBC-B, BBC B+, Electron, Master 128, Master Compact or Archimedes then this book is for you. It shows you how to get the most from your computer, and how to make the computer work for you. Although some sections are machine specific, most of the information, programs, hints and good solid experience are for the whole range of BBC machines. The general style and level means that both beginner and expert will feel satisfied with the quality and quantity of the material.

GENERAL – Uses and abuses of computers.

HARDWARE – How to design your own work station. Hardware additions (disc drives, ROMs, printers, 2nd processors, etc). DIY alterations.

HARDWARE RUNNING BBC-BASIC – All BBC machines are described with their differences. Compatibility between the various BBC machines. Networks. The Archimedes and its advantages.

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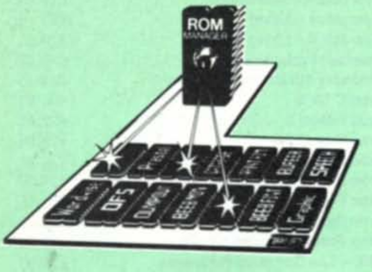
ROM MANAGER

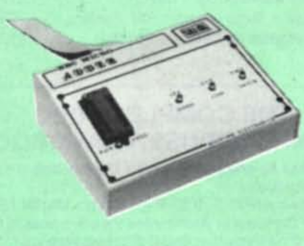


Take control of your Sideways ROMs with ROM Manager. This powerful utility ROM gives you power over your sideways ROMs . Disable whole ROMs, send commands directly to named ROMs and many other powerful facilities.

"Provides comprehensive management of all your installed ROMs". (BEEBUG November '84.)

ONLY £20

ADDER



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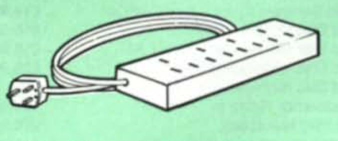

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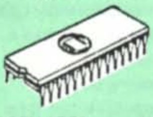

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TECHSOFT

DESIGNER intro

Created specifically for the Archimedes, **DESIGNER INTRO** is based on its big brother **DESIGNER (ARCHIMEDES)**. It shares the same uniquely logical menu structure and many of the powerful draughting routines. Enough power in fact to cope with all of most peoples' draughting requirements. Many of **INTRO's** features are shown below. There is one feature however that we cannot show - its most important one - the simplicity of use that guarantees a short learning curve and speedy drawing generation.

FEATURES

Fully menu driven with simple prompts and instructions for all routines.

User definable grid with grid lock.

Hunt and lock onto nearest end of line, arc or centre of a arc/circle with a single button press.

True arcs, tangents and normals, essentials for most drawing applications but particularly important for engineering applications. Nine in-built arc types alone.

Ellipses, full or part.

Powerful delete facilities, e.g., last item, line, part line, arc, part arc, etc (The software automatically finds intersections.)

Unique MODIFY command allows drawing to be redrawn a line at a time forwards or backwards. The drawing may be 'entered' at any point thus giving total flexibility to edit and alter drawings.

Automatic or manual dimensioning, user definable arrow heads/leader lines.

Text entry at any size, angle or slope. (Text output limited only by the plotter available.)

Hatching at any angle/spacing. Automatically finds enclosed boundary plus single or multiple islands.

Powerful ELEMENT (layer) structure.

No practical limit to the number of drawing elements that may be created.

Comprehensive transformation commands, MOVE, ROTATE, MIRROR IMAGE, ALTER SIZE.

No practical limit to the size of drawing created - limited only by disk space.

Libraries of drawings can easily be created. Library items can then be incorporated into the current drawing at any size, angle, position.

Zoom, scale and pan facilities (plot-outs may be taken at any time).

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P.S. If your draughting requirements are more demanding than normal take a look at **DESIGNER (ARCHIMEDES)**, more than a match for any drawing.

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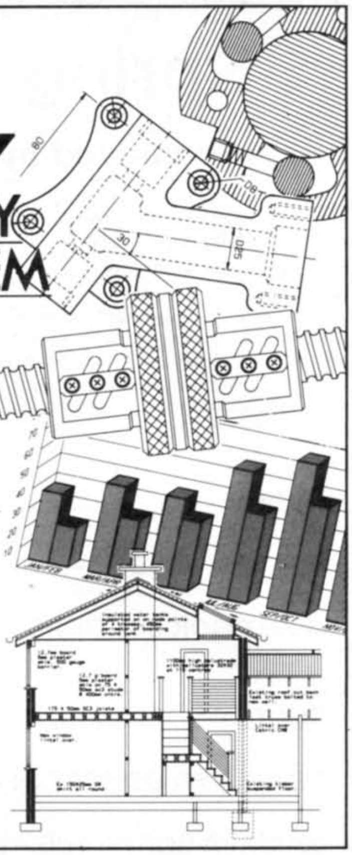

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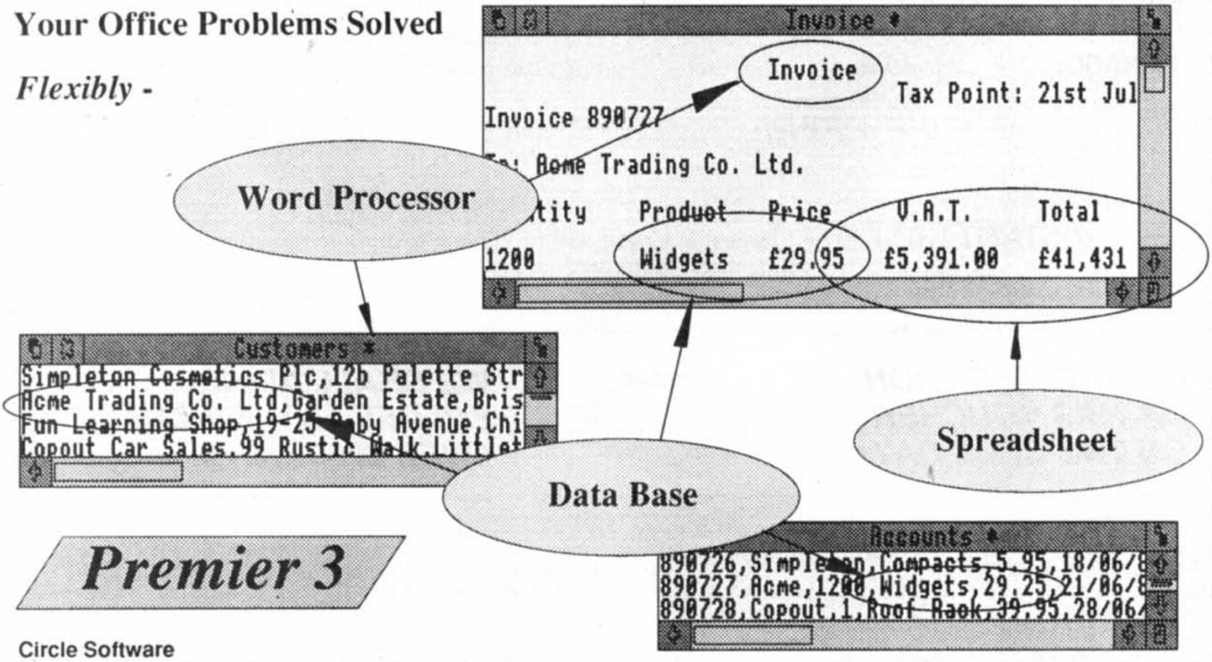

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Invoice                    Tax Point: 21st Jul
Invoice 890727
To: Acme Trading Co. Ltd.
...tity   Product   Price    V.A.T.     Total
1200      Widgets   £29.95   £5,391.00  £41,431
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890726,Simpleton,Compacts,5.95,18/06/8
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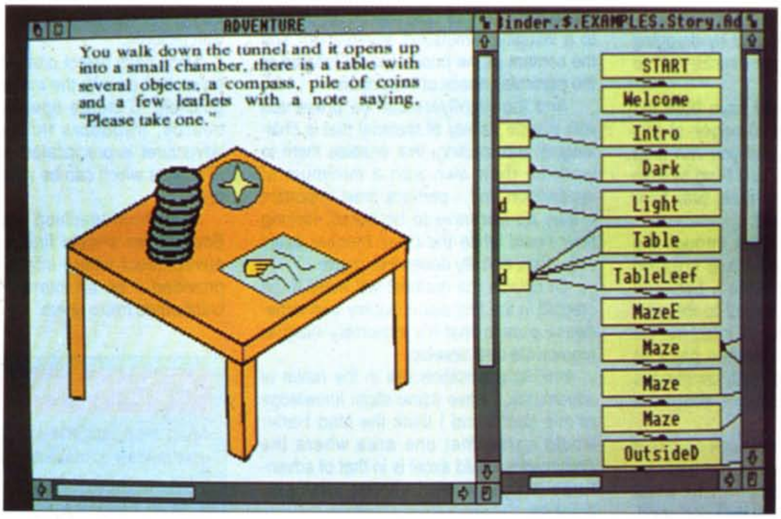
Premier combines Word Processing, Data Base, and Spreadsheet functions in one easy to use program



You walk down the tunnel and it opens up into a small chamber. there is a table with several objects. a compass. pile of coins and a few leaflets with a note saying. "Please take one."

Playing a game on Bookreader (left) that was created on Bookbinder (right)

Informatively interactive

Product: BookBinder
Price: £55.00
Requirements: Archimedes series with RISC OS or BBC A3000
Supplier: Musbury Consultants, 8 Fairhill, Helmshore, Rossendale, Lancashire BB4 4JX.

With new applications for the 32 bit machine arriving thick and fast, Bob Redrup discovers a unique communications medium

HOW often does something of literally staggering potential creep up on an unsuspecting world with a minimum of hype and fanfare? We're all used to viewing the gushings of games advertisements with a maximum of cynicism – so often the quantity of glowing hype is in inverse ratio to the quality of the program on offer. It's a bit like a preacher's memo to himself: *Shout here, argument weak.*

So when an innocuous package with the modest but tantalising title **BookBinder** arrived with its fairly slim instruction manual I wondered what I was being asked to take a look at.

Caution was further triggered by the way it rapidly became obvious that this particular utility was dependent upon three Archimedes applications that I hardly ever use – !Draw, !Paint and !Edit – frankly I am to art what Rambo is to the peace movement.

So rather than dive directly into the deep water of *how* I decided to explore the *what*. On the disc was something that looked like an adventure game so I double-clicked and up it came in a window. Clicking this produced a resizable window containing a little text and some pictures.

The text involved the start of an odyssey to buy a copy of BookBinder and instructed me to click the various pictures at will. Doing so evinced a number of different responses – for example clicking a *Please take one* leaflet changed the window to a further step on the road to Musbury Consultants while clicking the money resulted in a justified message about trying to take something that wasn't mine.

I began to get the idea – Bookbinder allows you to create *pages* within a window and move from one to another simply by clicking in the window – no keyboard input required. Thus encouraged, I returned to the manual and began to work through it.

One note of hope tempered my caution: It soon became clear that the early instructions were of the sort that even I can follow – they're pretty well idiot-proof.

Set up two working discs – you need the !System folder together with !Draw, !Paint and !Edit – because the whole set-up won't fit on a single disc. Of course, if you're lucky enough to have a hard disc this won't be a problem.

Next, I started to work my way carefully through the tutorial exercises involved in creating a small, working book. First of all I installed the !Binder utility on the icon bar with a simple double-click on the mouse.

Changing discs as instructed, I then copied and renamed another application (!BookRead) and opened it up to reveal the files contained in it – the one I needed was a directory called Pages.

This process could not have been more simple, even for a beginner: It was just a question of carefully following the instructions.

The next step involved the creation of a book – all of two pages long – by using the ready-made example. Clicking on the !Binder icon produced a book plan equivalent to the endpapers of a real book – a *start* and an *end*.

All that had to be done was to fill the space in between with a couple of !Draw

➤

➤

files called Page1 and Page2 by dragging their icons from the pages directory on to the book plan window.

If I had wanted, I could have filled the space with any number of pages at this stage, even duplicates, and you can drag pages from anywhere in any filing system but it's preferable to take them only from within the book reader itself.

I was then carefully taken through the procedure whereby links are created between the start and Page1, between Page1 and Page2 then Page2 to the end. After that it was a question of attaching the links to particular items on the page so that, when the book was read, clicking the appropriate location brought about the move to the next page.

Finally I had to *bind* the book so that it could be read – and when I did, I had created a simple introduction to what BookBinder had to offer. All well and good, but could I improve on this by being a little creative?

This is where !Draw comes in – each page of a book is composed of an A5 draw file. So to create your opus you need to plan and then put together each page. Draw files themselves can contain text and sprites as well, so you're not limited to lines, boxes and curves. In education I can see two types of pupil who would benefit in particular: The less able can be introduced to a visually stimulating environment and the content of the books can be tailored to the particular needs of individuals.

And the highflyers can be presented with a wide variety of material that is challenging and exciting, that enables them to work on their own with a minimum of supervision and – perhaps most important – they do not have to be bored, kicking their heels while the class teacher deals with other, equally deserving, pupils.

Of course the material will need to be created in the first place, but my own experience proves that it's extremely easy to manipulate and develop.

Another application lies in the realm of adventures. I have some slight knowledge of this genre and I think the Mad Hatter would agree that one area where the Archimedes could excel is in that of adventures which depend almost totally on graphics.

The author of BookBinder, Mike Cook, actually states *although it is capable of producing adventure-like stories, I am not pretending that it is an adventure generator.* Personally, I think this is selling it short.

A number of what I tend to think of as illustrated adventures have been produced for the Archimedes, but in BookBinder we have a utility capable in the right hands of producing an interactive adventure that is truly graphical rather than a text adventure with pictures.

Since each object created by !Draw can be clicked on with the mouse, it should be possible to create opening doors, cupboards, trapdoors through which the adventurer is precipitated, and all manner of objects which can be taken and manipulated.

Apart from teaching and adventures, BookBinder should find a home in any environment where information is to be provided – on an interactive basis – to uninformed micro users.

Summing up

Apart from minor modifications to the user guide – to make it even more idiot-proof – we have here a revolutionary utility that deserves the widest circulation.

It will prove particularly valuable in the field of education since it can readily unleash the imaginative powers of teachers without demanding that they have sophisticated programming skills.

An excellent and well thought out example of the kind of utility that is a credit to the Archimedes series.

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Cheshire Cat

Test your powers of logic and reasoning with this brain teaser from Jon Perry

HERE'S is a solo game designed make your brain boggle. The basic idea is to match the cat's faces on the left of the screen to the empty boxes. The spaces on the right contain exactly the same faces as shown on the left, but they are mixed up.

You can select which box and which face you want to test against each other – the response when you press Return to perform the check depends on which level you are playing on and which parts match.

There are two different ways in which the faces and boxes are connected.

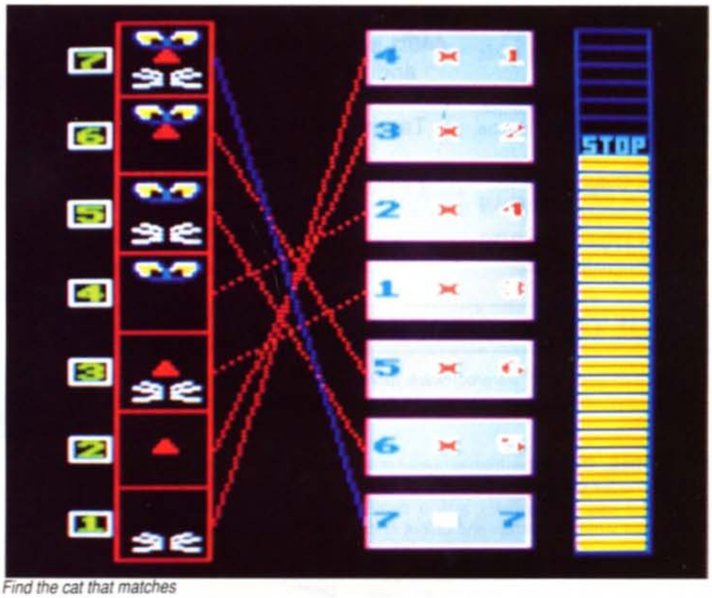
In Levels 1 and 2 a face matches a box if it has either exactly the same facial components – the correct fit – or if it has less parts than under the box.

The difference on Levels 3 and 4 is that a face matches a box either if it is exactly the same or if the box has less parts than the face.

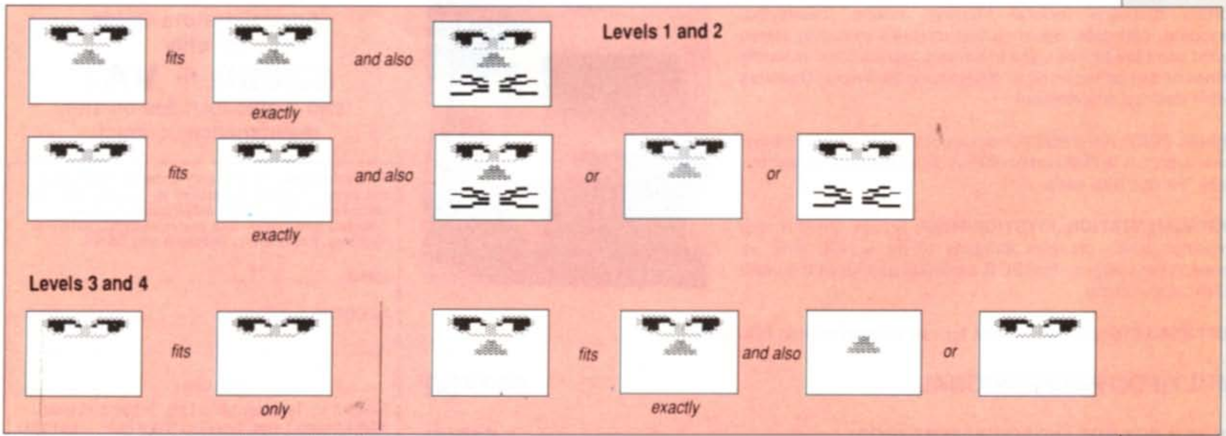
With Levels 1 and 3, three flashing squares show that an exact fit has been found, making the game easier than on the other two levels where the word FIT not only means a general fit but could also mean the exact fit. On all levels, three crosses indicate an incorrect fit – the criteria for the particular level has not been met.

Once you know which faces are behind which boxes, press G and match them up. Once all are matched, you will be shown how many were correct.

So type in the listing, check you have entered it exactly as it is printed using the checksums and remember to save it before you run it to test your powers of mental reasoning.



Find the cat that matches



Some example matches illustrate the logic of Cheshire Cat

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```
   10 REM Cheshire Cat
   20 REM  By J.Perry
   30 REM (c) The Micro User
   40 PROCreloc(&1300)
   50 ONERROR MODE7:REPORT:PRINT" at lin
e ";ERL:END
   60 MODE7:VDU23,1,0;0;0;0;
   70 PROCi:PROCj:PROCc
   80 MODE2:VDU5,23,1,0;0;0;0;
   90 PROCs:PROCg
  100 ti=0:REPEATti=ti+1:UNTILti>2000 OR
 NOTINKEY(0)
  110 CLG:GCOL0,1
  120 MOVE192,512:PRINT"Another Game ?"
  130 REPEATA=INKEY0:UNTIL A<>-1
  140 IFA=78 END
  150 RUN
  160 :
  170 DEFPROCi
  180 qu=-1:l=4:ol=4:r=4:or=4:go=0
  190 F=FALSE
  200 DIMk(7),lo(7),f(7)
  210 FORI=1TO7:lo(I)=I
  220 k(I)=100*(I DIV4)+10*((I MOD4) DIV
2)+(I MOD2):NEXT
  230 FORN=7TO3STEP-1:rd=RND(N-1):td=lo(
N):lo(N)=lo(rd):lo(rd)=td:NEXT
  240 ENVELOPE1,129,0,1,-1,0,1,1,127,-4,
-2,-14,126,0:*FX9,8
  250 ENVELOPE2,1,-2,-1,-1,200,50,1,10,-
1,0,-126,1,1:*FX10,8
  260 ENVELOPE3,2,0,0,0,1,1,1,126,-1,0,-
2,126,126
  270 ENVELOPE4,3,3,0,0,4,0,0,120,-3,0,-
4,100,120
  280 ENVELOPE5,1,15,7,0,1,1,6,127,-1,0,
-2,126,126
  290 ENVELOPE6,1,4,-3,-3,6,3,3,127,-1,-
1,-20,126,126
  300 ENVELOPE7,1,28,20,-48,1,1,1,126,-1
,0,-2,126,80
  310 ENVELOPE8,1,0,0,0,0,0,0,5,-1,0,-2,
100,80
  320 ENDPROC
  330 :
  340 DEFPROCj
  350 PROCdb(1,10,0,"Cheshire Cat")
  360 PROCdb(1,9,2,"_______________")
  370 PROCdb(6,5,5,"Sound On  :  Sound O
ff")
  380 PROCdb(2,0,11,"Choose level :")
  390 PROCdb(5,3,15,"One  :  Two  : Thre
e : Four.")
  400 PROCdb(4,0,20,"Press S and Q for s
ound.")
  410 PROCdb(4,0,22,"Press Return to cho
ose level.")
  420 C=0:REPEAT:C=C+1:IFC=5 C=1
  430 IFINKEY-82 qu=-1
  440 IFINKEY-17 qu=0
  450 PROCdb(4,17+qu*13,7,"__________")
  460 PROCdb(4,3-qu*13,7,"          ")
  470 IFqu SOUND0,1,1,4
  480 PROCdb(4,C*8-7,17,"______")
  490 IFC>1 PROCdb(4,C*8-15,17,"      "
) ELSE PROCdb(4,25,17,"      ")
  500 ti=0:REPEATti=ti+1:UNTILti>200 OR
INKEY-74
  510 UNTILINKEY-74:gl=18+C*3
  520 ENDPROC
  530 :
  540 DEFPROCdb(c,x,y,m$):FORI=0TO1:PRIN
TTAB(x,y+I);CHR$141;CHR$(128+c);m$:NEXT:
ENDPROC
  550 :
  560 DEFPROCc
```

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If you prefer to save the wear and tear on your fingers you'll find this listing – together with all the others from this issue – on this month's disc which will be sent free if you subscribe to *The Micro User*.

Main procedures

box()	draws box
c	defines characters
db()	prints letters in double height
k	draws faces
l	move left cursor
m	mark at end
r	move right cursor

Variables

k()	stores binary code of faces
lo()	face hidden behind box
f	flag for boxes

Keys

Select face	A	Up
	Z	Down
Select box	*	Up
	?	Down
	Return	Find connection
	Space	Speeds up pauses
	G	Start guessing

```
  570 VDU23,224,62,65,65,129,130,130,140
,240,23,225,0,62,62,78,12,12,0,0
  580 VDU23,226,124,130,130,129,65,65,49
,15,23,227,0,124,124,114,48,48,0,0
  590 VDU23,228,0,24,24,60,60,126,126,0
  600 VDU23,229,48,12,194,56,6,0,14,240,
23,230,12,48,67,28,96,0,112,15
  610 VDU23,231,0,238,238,238,0,187,187,
187,23,232,0,126,126,24,24,126,126,0
  620 VDU23,233,0,126,126,96,126,126,96,
0,23,234,0,102,126,60,60,126,102,0
  630 VDU23,235,0,126,66,90,90,66,126,0,
23,236,0,0,60,36,36,60,0,0
  640 VDU23,237,0,126,126,126,126,126,12
6,0,23,238,238,132,132,228,36,36,228,0
  650 VDU23,239,238,170,170,174,168,168,
232,0,23,240,0,126,126,24,24,24,24,0
  660 br$=STRING$(5,CHR$231)+CHR$10+STRI
NG$(5,CHR$8)+CHR$231+"   "+CHR$231+CHR$1
0+STRING$(5,CHR$8)+STRING$(5,CHR$231)
  670 f$=CHR$233+CHR$232+CHR$240
  680 ENDPROC
  690 :
  700 DEFPROCs
  710 FORI=1TO7:PROCk(I)
  720 NEXT:PROCl:PROCr:PROCx
  730 FORI=1TO29:PROCbox(4,1048,I*32-4,1
192,I*32+28):NEXT
  740 GCOL0,6:MOVE1064,gl*32-8:PRINTCHR$
238;CHR$239
  750 ENDPROC
  760 :
  770 DEFPROCbox(c,x,y,x1,y1):GCOL0,c:MO
VEx,y:DRAWx,y1:DRAWx1,y1:DRAWx1,y:DRAWx,
y:ENDPROC
  780 :
  790 DEFPROCk(s)
  800 t=s*136:PROCbox(7,160,t+16,336,t-1
20):PROCbox(7,72,t-32,144,t-72):GCOL0,2:
MOVE80,t-40:PRINT;s
  810 PROCbox(5,640,t,960,t-96)
  820 MOVE640,t:PRINTbr$:PROCbox(7,696,t
-28,896,t-64)
  830 IFk(s)>99 GCOL0,4:MOVE192,t:PRINTC
HR$226;CHR$224:GCOL0,3:MOVE192,t:PRINTCH
R$227;CHR$225
  840 IF(k(s)/10) MOD10=1:GCOL0,1:MOVE22
4,t-32:PRINTCHR$228
  850 IFk(s) MOD 10=1:GCOL0,7:MOVE192,t-
72:PRINTCHR$229;CHR$230
  860 ENDPROC
  870 :
  880 DEFPROCl
  890 FORI=0TO1
  900 IFI=0 t=ol*136 ELSE t=l*136
  910 PROCbox(7-I*6,160,t+16,336,t-120)
  920 NEXT:ENDPROC
  930 :
  940 DEFPROCr
  950 FORI=0TO1
  960 IFI=0 t=or*136 ELSE t=r*136
  970 PROCbox(5-I*4,640,t,960,t-96)
  980 NEXT:ENDPROC
  990 :
 1000 DEFPROCx
 1010 FORI=0TO1:GCOL0,I
 1020 IFI=0 t1=ol*136-52:t2=or*136-52 EL
SE t1=l*136-52:t2=r*136-52
 1030 MOVE344,t1:DRAW632,t2
 1040 NEXT:ENDPROC
 1050 :
 1060 DEFPROCg
 1070 REPEAT:REPEAT
 1080 IFINKEY-98:IFl>1 l=l-1:PROCl:GOTO1
100
 1090 IFINKEY-66:IFl<7 l=l+1:PROCl
 1100 IFINKEY-73:IFr<7 r=r+1:PROCr:GOTO1
120
 1110 IFINKEY-105:IFr>1 r=r-1:PROCr
 1120 IFor<>r OR ol<>l PROCx
 1130 ol=l:or=r
 1140 IFINKEY-84 F=TRUE
 1150 UNTILINKEY-74 OR F=TRUE
 1160 IFF=TRUE GOTO1270
 1170 IFqu SOUND&11,2,255,5:SOUND&10,3,7
,3
 1180 PROCq:R=r*136-32
 1190 go=go+1:PROCy
 1200 IFS=0co=2:S$=f$:IFqu SOUND1,4,40,1
 1210 IFS=1 co=1:S$=STRING$(3,CHR$234)
 1220 IFS=2 AND (C=2 OR C=4) co=2:S$=f$:
IFqu SOUND1,4,40,1
 1230 IFS=2 AND (C=1 OR C=3) co=8:S$=STR
ING$(3,CHR$235):GCOL0,15:MOVE704,R:PRINT
STRING$(3,CHR$236):IFqu SOUND1,5,80,10
 1240 GCOL0,co:MOVE704,R:PRINTS$
 1250 ti=0:REPEATti=ti+1:UNTILINKEY-99 O
Rti>1000
 1260 GCOL0,0:MOVE704,R:PRINTSTRING$(3,C
HR$237)
 1270 UNTILF OR go=gl-2
 1280 PROCz:PROCm
 1290 ENDPROC
 1300 :
 1310 DEFPROCq
 1320 L=lo(r)
 1330 IFC>2 V=0:LO=100-100*(L DIV4)+10-1
0*((L MOD4) DIV2)+1-(L MOD2):IFLO+k(l)=1
11 S=2:ENDPROC
 1340 IFC<3 V=1:LO=100*(L DIV4)+10*((L M
OD4) DIV2)+(L MOD2):IFl=L S=2:ENDPROC
 1350 IFk(l) DIV100=V AND LO DIV100=0 S=
```

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```
1:ENDPROC
 1360 IF(k(L)/10) MOD10=V AND (LO/10) MO
D10=0 S=1:ENDPROC
 1370 IFk(L) MOD10=V AND LO MOD10=0 S=1:
ENDPROC
 1380 S=0:ENDPROC
 1390 :
 1400 DEFPROCy
 1410 FORi=0TO1:GCOL0,3-2*i
 1420 G=4+go*32:I=i*12
 1430 MOVE1056,I+G:MOVE1184,I+G
 1440 PLOT85,1056,20-I+G:PLOT85,1184,20-
I+G:NEXT
 1450 ENDPROC
 1460 :
 1470 DEFPROCz
 1480 PROCbox(7,160,l*136+16,336,l*136-1
20):PROCbox(7,640,r*136,960,r*136-96)
 1490 GCOL0,0:MOVE344,l*136-52:DRAW632,r
*136-52
 1500 r=4:or=4:FORJ=1TO7
 1510 ol=J:l=J:PROCl:PROCx:PROCr
 1520 REPEAT
 1530 IFINKEY-73:IFr<7 r=r+1:PROCr:GOTO1
550
 1540 IFINKEY-105:IFr>1 r=r-1:PROCr
 1550 IFr<>or PROCx
 1560 or=r
 1570 X=0:FORK=1TO7:IFf(K)=r X=1
 1580 NEXT
 1590 UNTILINKEY-74 AND X=0
 1600 f(J)=r:GCOL0,0:MOVE344,l*136-52:DR
AW632,r*136-52:PROCf
 1610 NEXT
 1620 ENDPROC
 1630 :
 1640 DEFPROCf
 1650 FORI=0TO44STEP4
 1660 PROCbox(6,648+I,r*136-I-4,952-I,r*
136-92+I)
 1670 NEXT:GCOL0,4:MOVE648,r*136-32:PRIN
T;J
 1680 ENDPROC
 1690 :
 1700 DEFPROCm:*FX15
 1710 PROCbox(5,640,r*136,960,r*136-96)
 1720 rig=0:FORI=1TO7
 1730 FORJ=1TO7:IFlo(J)=I k=J
 1740 NEXT
 1750 IFk=f(I) rig=rig+1:GCOL0,8:MOVE772
,k*136-32:PRINTCHR$235:C=15:S=2 ELSE C=1
:S=0
 1760 SOUND1,1,48+S*24,4
 1770 GCOL0,C:MOVE772,k*136-32:PRINTCHR$
(234+S):IFk=f(I) GCOL0,4
 1780 MOVE344,I*136-52:PLOT21,632,k*136-
52:MOVE896,k*136-32:PRINT;I
 1790 ti=0:REPEATti=ti+1:UNTILti=500 OR
NOTINKEY(0)
 1800 NEXT
 1810 ti=0:REPEATti=ti+1:UNTILti=2000 OR
 NOTINKEY(0)
 1820 CLG:FORI=0TOrig
 1830 SOUND1,6,50+I*5,20
 1840 FORJ=0TO7:j=16+J*160:i=(I+1)*128
 1850 IFrig=7 c=RND(7) ELSE c=6
 1860 PROCbox(c,j-4,i+4,j+128,i-108)
 1870 GCOL0,4:MOVEj,i:PRINTCHR$226;CHR$2
24:GCOL0,3:MOVEj,i:PRINTCHR$227;CHR$225
 1880 GCOL0,1:MOVEj+32,i-32:PRINTCHR$228
 1890 GCOL0,7:MOVEj,i-72:PRINTCHR$229;CH
R$230
 1900 NEXT:NEXT
 1910 IFgo<10 g=32 ELSE g=0
 1920 IFrig=7 GOTO2010
 1930 R=rig*128+208
 1940 GCOL0,4:MOVE64,R:PRINT"You got   c
orrect"
 1950 MOVE192,R-40:PRINT"in    guesses"
 1960 FORI=0TO1:GCOL0,4+I*2
 1970 MOVE576+I*8,R+I*4:PRINT;rig:MOVE38
4+I*8+g,R-40+I*4:PRINT;go:NEXT
 1980 ti=0:REPEATti=ti+1:UNTILti=2000 OR
 NOTINKEY(0)
 1990 ENDPROC
 2000 :
 2010 FORI=0TO128STEP4
 2020 PROCbox(0,328+I,400+I,948-I,656-I)
:NEXT
 2030 GCOL0,4:MOVE576,536:PRINT"in":MOVE
416,448:PRINT"guesses"
 2040 FORI=0TO1:GCOL0,4+I*2
 2050 MOVE320+I*8,614+I*4:PRINT"ALL RIGH
T!":MOVE576+I*8+g,488+I*4:PRINT;go:NEXT
 2060 IFqu=FALSE GOTO2110
 2070 P%=0:D%=2:SOUND2,0,0,3:SOUND3,0,0,
6:FORI%=0TO16:FORE%=3TO5
 2080 P%=(P%+E%)AND31
 2090 SOUND1,7,P%*4,D%:SOUND2,8,P%*4,D%:
SOUND3,8,P%*4,D%
 2100 NEXT:NEXT
 2110 ti=0:REPEATti=ti+1:UNTILti=2000 OR
 NOTINKEY(0)
 2120 ENDPROC
 2130 :
 2140 DEFPROCreloc(Q%):CLS:*T.
 2150 P%=PAGE:IFP%<=Q% ENDPROC
 2160 L%=TOP-P%:PRINTCHR$129CHR$136"Relo
cating....."
 2170 FORM%=0TOL%-1STEP4
 2180 Q%!M%=P%!M%:NEXT
 2190 PAGE=Q%:A%=138:X%=0:*FX15
 2200 $&100="OLD"+CHR$13+"RUN"+CHR$6+CHR
$13
 2210 FORL%=&100TO&108:Y%=?L%
 2220 Z%=USR&FFF4:NEXT:VDU21:ENDPROC
```

All program listings in this issue can be downloaded FREE on...
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```
  10 =    0 0
  20 =    0 0
  30 =    0 0
  40 = 1307 7
  50 = 936C A
  60 = A8DF F
  70 = 92DD C
  80 = 100C F
  90 = C9FA B
 100 = 4AFA F
 110 = 6BD9 5
 120 = 8131 2
 130 = B3A0 9
 140 = E98B 8
 150 = 7E36 F
 160 = 9719 E
 170 = AFE9 8
 180 = 245D 9
 190 = 594D 3
 200 = C2DD 7
 210 = DC35 E
 220 = F2FA 1
 230 = 87D1 0
 240 = D1A6 E
 250 = 1589 5
 260 = 5247 4
 270 = 63D6 5
 280 = A6E5 4
 290 = 3B55 B
 300 = 9A65 A
 310 = 52F9 A
 320 = ED0F C
 330 = 9719 E
 340 = 9F8A 9
 350 = F74C 3
 360 = A59B E
 370 = F650 1
 380 = 63D1 F
 390 = 4C1C C
 400 = E976 B
 410 = 431F 2
 420 = 3BD5 2
 430 = D54A 7
 440 = 9025 1
 450 = 7850 0
 460 = 8E13 1
 470 = 8F38 E
 480 = 5438 1
 490 = D28C 0
 500 = 157F 5
 510 = 5E1D 6
 520 = ED0F 0
 530 = 9719 A
 540 = E18D 2
 550 = 9719 7
 560 =  EA3 8
 570 = E9C2 9
 580 = 4055 9
 590 = CDC8 4
 600 = F849 D
 610 = AE7D 3
 620 = 1B0B A
 630 = 4F54 7
 640 = C612 F
 650 = 93C3 F
 660 = 9D5A 3
 670 = 6950 6
 680 = ED0F B
 690 = 9719 F
 700 = 1C92 C
 710 = 45ED 0
 720 = EAC6 6
 730 = 41AF D
 740 = 67AF 9
 750 = ED0F 9
 760 = 9719 A
 770 = 6D80 2
 780 = 9719 9
 790 = 11C9 C
 800 = 949B E
 810 = ABAD 1
 820 = 40AF 8
 830 = 8899 8
 840 = 830B D
 850 = E8CD 9
 860 = ED0F D
 870 = 9719 7
 880 = FF4C 3
 890 = 9DD0 6
 900 = D6EE C
 910 = E24E 2
 920 = E531 1
 930 = 9719 F
 940 =  CB3 1
 950 = 9DD0 9
 960 = A2B8 3
 970 = 58DB 3
 980 = E531 C
 990 = 9719 E
1000 = ADF9 7
1010 = 1903 1
1020 = CCCB 1
1030 = 6BCC A
1040 = E531 4
1050 = 9719 4
1060 = 4E27 5
1070 = 5D46 0
1080 = 4F00 A
1090 = BD92 D
1100 = 98A5 B
1110 = 37E7 8
1120 = BD36 A
1130 = 470A B
1140 =  EBC E
1150 = 14D8 0
1160 = 5B71 8
1170 = 50DD E
1180 = 15D0 0
1190 = 310E 7
1200 = 1087 7
1210 = 384D F
1220 = 7A9C 4
1230 = 4E50 9
1240 = AC1E 6
1250 = E955 4
1260 = 28A2 F
1270 = 728E B
1280 = 9BC7 C
1290 = ED0F E
1300 = 9719 6
1310 = 3CD0 D
1320 =  594 7
1330 = BB1A 9
1340 = BC6A F
1350 = F2A1 9
1360 = AD62 E
1370 = 5876 B
1380 = 2C7B 1
1390 = 9719 E
1400 = BDD8 9
1410 = C6C8 A
1420 = 675D F
1430 = 6159 2
1440 = 3310 9
1450 = ED0F 0
1460 = 9719 C
1470 = 8DBB E
1480 = C19A E
1490 = 9278 B
1500 = F13A 7
1510 = 34AF A
1520 = BFBA 5
1530 = DE6D 8
1540 = 37E7 6
1550 = B29D C
1560 = 1648 4
1570 = 7D9C A
1580 = 2C83 2
1590 = C51D 7
1600 = E48A 9
1610 = 2C83 D
1620 = ED0F 5
1630 = 9719 5
1640 = 5E06 8
1650 = 6E89 E
1660 = 5E73 A
1670 = 5F2F 8
1680 = ED0F B
1690 = 9719 8
1700 = 7F31 0
1710 = CC7E A
1720 = CDD7 A
1730 = 1257 9
1740 = 2C83 A
1750 = 1D74 7
1760 = B069 8
1770 = B313 3
1780 = D2C4 4
1790 = 82E2 2
1800 = 2C83 4
1810 = 855F F
1820 = C127 D
1830 = 2BBC 9
1840 = B410 7
1850 = 485B 8
1860 = 69E7 C
1870 = 7BEF 8
1880 = A615 F
1890 = 2460 6
1900 = 24BD 6
1910 = 911C A
1920 = 2ADC B
1930 = 2740 7
1940 = 131C 2
1950 = 578D 0
1960 = D82D D
1970 =  E09 9
1980 = 855F 7
1990 = ED0F A
2000 = 9719 7
2010 = D3EE 4
2020 =  443 8
2030 = CF76 6
2040 = D82D 2
2050 = C845 E
2060 = 8627 6
2070 = 7801 A
2080 = 1AE9 C
2090 = 366C A
2100 = 24BD 2
2110 = 855F 4
2120 = ED0F E
2130 = 9719 A
2140 = BA15 0
2150 = 8F78 7
2160 = 2A7F 3
2170 = 5769 6
2180 = E316 B
2190 = AF02 1
2200 = 889C E
2210 = 7ACF C
2220 = 302A 2
```

MICRO USER CLASSIFIEDS

- BBC B with DFS, £200. 0564 773326, Knowle, W. Mids.
- Wanted: Eprom programmer for BBC B. Preferably up to 64k bit, but others considered. 01-531 1703 (ansaphone).
- BBC B Issue 7, 1770 DFS, Viglen d/drive 40/80, Philips 1114 col. TV/RGB monitor, £300 extras: Software etc, joystick – worth £1,100, sell, £350 ono. 0634 668706.
- Risc OS, Arc 310M, monitor, LC24-10 printer, Cumana 3.5in+5.25in drive, Pipedream, Delta +, Scientific fonts, backplane, romboard, interfacee, four word processors, blank discs, loads of software, extras, textbooks, manuals, best offer above £1,500. Phone 01-504 8107.
- Wanted. Computech Integra-B board, ADFS chip, Spellmaster, Mega 3, Viglen console, all for BBC B. Surrey evenings, 0737 552626.
- BBC B Issue 7, DFS 3.5in and 5.25in drive, Watford 32k ram/rom board, 12 roms inc Pascal, Spellmaster, WW+, Pagemaker, AMX mouse, joysticks, games, £350+. 01-363 5154 after 5pm.
- BBC B, twin 80T drives, Microvitec colour monitor, Z80 second processor, boxes, books, little used, £650. Guildford, 0484 37081 evenings.
- Master 512k, Plinth 2 x 5.5, 40/80 d/drive, Morley teletext + design, d/rec, joystick, leads, manuals, games, Beebug CAD, cartridges etc, £600. Tel: 0444 811716.
- BBC B, 40/80T d/disc, Acorn DFS, +16k sideways ram, AMX mouse, b/w monitor, eproms, books, discs, tapes, £275. Tel: 0259 723952.
- BBC B+, Cumana 40T disc drive, BMC greenscreen monitor, word processor rom (Proword), £330 ono. Tel: 0603 664827 evenings (Norwich), will deliver locally or to London area.
- Archimedes software (originals): PC Emulator, £38. Artisan Support Disk, £8. E-Type, £12, Quazer, £5. 0773 873611, Paul.
- Archimedes 310 colour + 20Mb Acorn hard disc + external disc interface, £995 ono. Tel: 051-724 4508 evenings.
- Archimedes 310, Risc OS, colour monitor, manuals, games: E-Type, Zarch etc, £750. Phone 051-678 3583
- BBC B c/w, 40/80T twin disc drives, colour monitor, Watford rom board with many roms including Wordwise+, £400 ono. Phone 01-561 4375 evenings.
- BBC B switchable drives, colour monitor, Interword, Interbase, Spellmaster, books, much more. Offers: 01-549 2347.
- BBC B, 32k plus 16k sideways ram, rom board, AMX mouse, double sided 40T disc drive, Wordwise+, graphics extension rom, worth £900. Sell for £250. Tel: Stoke-on-Trent (0782) 219106
- Prism 1000 modem with leads and Micronet, £60. Wordmonger's Z-Ter, £25. 041-942 9447.
- Archimedes A310, Risc OS, backplane, fan, PRM, £575 ono. Tel: 061- 456 9293 or 061-428 0771 ext. 3525.
- Master Turbo, Microvitec 1451, Akhter dual DS 40/80T disc drive, Acorn teletext adaptor, monitor, Plinth, joysticks, much software, books, roms, etc. Genuine bargain, £650. Telephone Taunton (0823) 257464.
- Loadsa games for BBC B, Spellbinder, Quest etc, mags, cheats. Worth £150, sell £90 ono. Tel: 0278 451188 after 7pm.
- BBC B, OS1.2, QFS 2.0, Microvitec colour monitor, Cumana 40T single drive, Epson RX80 dot matrix printer, Wordwise+, and games, £295 ono. Tel 0536 745135.
- Disc drive 80 track, single, £40. Tel: 0373 830834 (Bath).
- BBC B 1770DFS, ADFS, Cumana 40/80T d/drive, S/W ram, Watford rrom board, AMX mouse + SuperArt, monitor stand, £100 software, many roms, magazines, discs, disc box, £380. Tel: 061-439 7097 after 5pm, ask for Mike.
- BBC B OS1.2 with over 200 games, tape recorder, leads, lots of magazines, 3 volumes of Beebug, bargain at £210. Phone 7-9pm (0932) 242960.
- BBC B, data recorder, joystick, 40 games, leads, manuals, books, mags, boxed, £180 ono. 0734 576408.
- Wanted please. Micro User disc October 1987, phone Gordon, 0384 60639.
- BBC B 32k, Opus single disc drive, 40/80T manuals, many games eg Superman, £250. Tel: 0332 552168.
- Cambridge co-processor, 16 bit, one megabyte second processor for BBC Micro, includes C, Fortran, Pascal, Lisp, Basic and assembler, £350. Tel: 0704 821282.
- Viglen DS 40/80T drive, £45. Acorn Teletext Adaptor (with ATS), £45. Solidisc 32k SWR, £5, roms, mags, books, loadsa original disc, tape software, 0787 247877.
- Master Compact with PAL-TV convertor, hardly used, £200 ono. Tel: 0206 385100 after 6pm.
- Kinship (Master), £20. Worlds Without Words, £20. Elite, £6. Graphito, £6. Joe 1, £3. Imogen, £3. Replay (1770DFS), £9. Tel: 0344 55772 evenings.
- BBC B Issue 7, dual DS 40/80 drives, rom board, 48k sram, replay, Beebmon, ADI, books. Phone 0698 65886, £350.
- Archimedes original software. Unused, 1st Word Plus, £50. 0794 522297.
- Colour monitor, suitable for BBC B, Spectrum+, £60 ono. External power supply for BBC disc drives, £15 ono. Replay, £15 ono. Morley Teletext Adaptor, £40 ono. Some games, roms etc. Telephone 0509 502346.
- Disc drives, Japanese YE-Data 3.5in used, £25. Panasonic DS 80T, £25. Tel: 0229 85201
- Watford Co-pro Adaptor with Master 512 board, Acorn ADFS, Dos OS, Gem, mouse and manuals, £75. Spare 512 board, £25. Cumana 40T SSSD disc drive for BBC, £25. 8271 disc upgrade with DFS and all other chips, £10. Telephone 0256 882380.
- Master 128, reference manuals, Cumana twin 80T drives, Interword, PMS, NTQ roms (Epson), various games (originals), joystick, £400 + carriage. Tel: 01-658 3479.
- Electron Pegasus 400 5.25in disc drive + interface, T2D, games, discs, £100. 0435 32388.
- Archimedes A310M colour, Risc OS, 20Mb HD, 4 slot backplane, 5.25in disc buffer, manuals, mags, £1,150 ono. Phone David, 0895 71815.
- Master Compact with colour monitor and disc drive, RS232 upgrade kit, Appollo modem, Epson LX-80 printer stand and 15 top games including Exile, Elite, Repton, Infinity etc, £700. Phone Hoddesdon 443960, (Darren) weekends only.
- Torch Z80 second processor with CPN Z80 Basic, Perfect Writer, Perfect Calc and Perfect Filer, £85 ono. Kevin 0475 704483.
- Acorn User issue one July 1982 to April 1988, all in binders, £25. Tel: 0664 63072.
- Program or copy your own eproms/eproms, 24 or 28 pin. Includes eraser & separate 128k adaptor, module professional standard, excellent value at £150. Tel: 0206 560019 evenings.
- BBC B, 40/80 double side disc drive, colour monitor, tape recorder, joystick and desk, £400. Phone 0268 768898 (Essex).
- BBC B, Watford DDFS 40/80 drive, Music 500, SuperArt, some

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● BBC B, 40/80T drive, Watford rom/ram board, ATPL complete with roms – View, Wordwise, Intersheet, Interchart (full board) – lots of roms, software, books, subs to The Micro User, back issues, with discs, £350. Tel: 01-961 3843 (evening).

● BBC B, dual 40/80 disc drive, Watford digitiser, 16k rom/ram board, and software a'plenty (Holed Out, Barbarian etc), £350. Phone 0532 872700.

● Archimedes 420, Taxan 770 multi-scan, Acorn DTP, 1st Word+ 2nd edition, Pro-Artisan, PC emulator. All under 4 months old, £1,800 ono. Tel: 0428 2083 or 54182.

● BBC B Issue 7, 40TSS/100 disc drive, Citizen LSP-10 printer, Wordwise+, all manuals, excellent condition, £350 ono. Tel: 01-524 4926 after six.

● Archimedes 150 Pascal, £55. Beebug 5.25in disc interface, £20. Music 5000 £100. Reading 874769.

● Archimedes 310 with Risc OS, backplane and First Word Plus, boxed and in excellent condition, £600. Phone 0536 724981.

● Archimedes 310M, colour, Risc OS, backplane fan, I/O podule, 2nd drive, inteface, manuals, software including PC Emulator, £900 ono. 0702 460537.

● Master Compact, TV adaptor, mouse, plus extras, manuals, £300. Tel: 0603 419860.

● EMR midi interface plus 16 track composer software for Model B, £80 ono. Yamaha DX27 keyboard, £250 ono. Tel: 01-572 3790 evenings.

● BBC B Issue 7, Solidisk 2Meg128, Dumpout 3, Watford DFS1.44, Digimouse, £250. Watford DS/DD 40/80T disc drive, £60. 50 blank discs, £15. 7 good games including Lancelot, Bonecruncher, £15. Phone Bexley (0322) 53672 evenings.

● 8271 disc controller, IC unused, £27.50. Tel: 0926 493092.

● BBC B 1.20S Watford DDFS 1.54T 40/80T Cumma disc drive, B/W television, Acorn data recorder, loads of software including Fleet Street Editor, double joysticks, £410. Tel: 0225 872041 (Phil).

● BBC B, DDFS, twin 40/80 disc drive, rom board with 16k ram, Wordwise Plus, Ultracalc 2, Microvitec med-res monitor, Epson printer, cables and books, £600. 0706 228908.

● 8271 disc controller, IC unused, £27.50. Tel: 0926 493092.

● Printers for sale: Epson RX180 and Brother M1008. Phone Clive on 061-428 6935 with offers, will split. After 6pm.

● BBC B Issue 7, 40T dual disc drive, Kaga 12in green monitor, Sideways ram/rom, Wordwise Plus, Intersheet, Viewstore, £250 ono, Juki 6100 daisywheel printer, offers. Phone 0625 529287 (Cheshire)

● Taxan KP810 printe, manuals, dust cover, 3 new ribbons, plus box of paper, £120. 01-445 7875

● Colour Archimedes 310M with PC emulator, £100s of original software, PC shareware, £700 ono. Phone 01-586 2970 evenings only.

● Master Compact, Acorn RGB colour monitor, 3.5in and 5.25in drives, Solidisk DFS, Quest Mouse, Logo View, Fleet Street Editor, games, perfect condition, £400 or offer. Tel: 0494 444730 evenings.

● BBC Master, disc drive, monitor, software, £425 ono. Tel: 0277 625745.

● Wanted. Acorn Electron, full working order. Ring 01-858 5141 evenings.

● BBC B 1.20S, Watford DDFS 1.54T, 40/80T Cumma disc drive, b/w television, Acorn data recorder, loads of software including Fleet Street Editor, double joysticks, £410. Tel: 0225 872041 (Phil).

● BBC B 1.20S, Watford DDFS 1.54T, 40/80T DSDD Watford disc drive, b/w television, Acorn data recorder, loads of software including Fleet Street Editor, double joysticks, £490. Tel: 0225 872041 (Phil).

● Wanted. Grafpad for BBC B, also required Image Graphics package and 80T drive or teletext adaptor. All prices considered, contact David on 0924 498248 anytime. Collection can be arranged (reasonably).

● A full set of Micro User magazines up to November '89, £40. Also a Mauler eprom blower and eraser, £35. Please phone 0532 893103.

● BBC B Issue 7, 256k expansion, DSDD drive, teletext DFS, ADFS, Basic 4, clock, View, Viewsheet, eprom programmer/eraser, many roms and software, £400 ono. Telephone 0384 270985.

● Games all original. BBC and Master, some educational. Tel: 0482 896868.

● Master 128, 65C102 co-processor, ADT, Microvitec 1451 monitor, Opus 40/80T dual drive, reference manuals 1, 2 and advanced, View and Viewsheet user guides, Voltmace Delta 146 joystick, Elite and Revs plus Revs 4 tracks, ten spare discs, £625. 0524 63060 (Lancaster) evenings.

● BBC B DFS, sideways ram, Speech chip, dual drives, data recorder, 100+ games, programs, many roms (eg GXR, Wordwise+ etc), joystick, books, excellent condition, £600 ono. Tel: Prash 01-686 2895.

● Archimedes A310M colour monitor, 20Mb hard disc, PC emulator, First Word+, Hearsay etc, all manuals, perfect condition, £1,100. Tel: 0883 349129 (Caterham) evenings.

● Wanted. Archimedes owners in the Keighley/Bradford/Skipton area boxed as new, discs, books, T2P3, Viewsheet cartridge, £210 complete. Tel: Southend (0702) 292689.

● Master Compact, Mega 3, Dumpout 3, monochrome monitor, Panasonic KX-P1081 printer, Cumana 80/40T 5.25in drive and leads. All boxed, manuals, 40 discs, software inc Logo, View, £600. Tel: 0788 832310 (Rugby).

● Commodore PC1 green monitor, MSdos single disc drive, 6 months old, £200. Reading 0734 391735, Miss Eunice (room 16) after 7.30pm.

● AP3/4 interface woth 2nd drive lead, £40. AP1 with AP2 rom, Ap6 and T2P3, £50, 3.5in disc drive with PSU, £45. Joystick, £4, all boxed, for Electron. Tel: 0203 311382.

● Wanted: Overview for Master 128. Farnborough (0252 549932) after 7pm.

● Archimedes A310M colour, 20Mb hard disc, 5.25in disc interface, Hearsay, 1st Word+, Ansi C, twin Archway System Delta, PC emulator, full Risc User, lots more software, books, £1,300 ono. Phone 0772 741056.

● Wanted. Opus Ddos to recover lost data. 0244 675606 (evenings).

● For sale. A BBC B Issue 7 with DS dual 40/80T switchable disc drives (with PSU), Aries B32+B12 with 16k Swram fitted, 5 roms including Acorn DFS 2.26, cassette recorder, joystick adaptor, lots of magazines (£60 worth), plus over £1,700 worth of software including Holed Out, P.I.A.S 1, 3, 4, 5, 6, 7 etc, leads, offers. Also replay MkII, £10. Sega Master System, Touchpad, Adapter, leads, over £140 worth of games including Quartet, Hang On, Fantasy Zones I, II etc, £75. Tel: 0734 64633 between 4 and 10pm.

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◄ From Page 51

```
 520 VDU23,228,24,24,0,255,255,0,24,24
 530 VDU23,229,0,0,255,0,0,255,0,0
 540 ENDPROC
 541 :
 542 DEFFNs(S%)=STRING$(S%," ")
```

Lising II

```
   10 REM Wormy2
   20 REM by Martin Sann
   30 REM (c) The Micro User
   40 MODE1:VDU23;8202;0;0;0;
   50 DIM c%(10),d%(10),sc%(8),hi%(8),K%
(100):lv%=0:sp=0
   60 sum$=" "+CHR$224+" "+CHR$229+" ":c
l$=STRING$(36," "):pr$="Press a key"
   70 *FX200,1
   80 *FX11,0
   90 PROCch:PROCvars:PROCrnd(9)
  100 PROCscr:PROCnum:IF GET PROCplay
  110 END
  120 :
  130 DEFPROCch
  140 @%=1:CLS:VDU19,0,4;0;:PROCmfr
  150 COLOUR2:PROCload(F$)
  160 PRINTTAB(8,7)"Level"
  170 PRINTTAB(18,7)"Score"
  180 PRINTTAB(26,7)"Hiscore"
  190 FOR lev=1TO8:lev$=STR$(lev)
  200 sc%(lev)=?(&37F+lev)
  210 hi%(lev)=?(&387+lev)
  220 IF L%=0 ?(&387+lev)=hi%(lev)
  230 sclev$=STR$(sc%(lev))
  240 hilev$=STR$(hi%(lev))
  250 IF lev<3 op$=CHR$225
  260 IF lev>2 AND lev<5 op$=CHR$226
  270 IF lev>4 AND lev<7 op$=CHR$227
  280 IF lev>6  op$=CHR$228
  290 PRINTTAB(8,8+2*lev)op$+"   "+lev$
  300 PRINTTAB(22-LEN(sclev$),8+2*lev)sc
lev$
  310 PRINTTAB(31-LEN(hilev$),8+2*lev)hi
lev$
  320 NEXT lev:L%=1:CLOSE#0
  330 PRINTTAB(8,28)"Press S to save his
cores"
  340 PROCchoice("Choose level 1 to 8",9
)
  350 IF G=35 PROCsave(F$):GOTO340
  360 PRINTTAB(2,28)cl$
  370 PRINTTAB(8,28)"Level"
  380 lv%=G:PRINTTAB(15,28)STR$G
  390 PRINTTAB(23,28)"Speed  ?"
  400 PROCchoice("Choose speed  1 to 3",
4)
  410 IF G=35 VDU7:GOTO400
  420 sp=G:PRINTTAB(30,28)STR$G
  430 I=INKEY(100):*FX15,0
  440 CLS
  450 ENDPROC
  460 :
  470 DEFPROCmfr
  480 GCOL1,3:PROCfr(16,936,1264,1008)
  490 PROCfr(16,16,1264,912)
  500 PROCfr(24,24,1256,904)
  510 ENDPROC
  520 :
  530 DEFPROCfr(Xo,Yo,X,Y)
  540 MOVEXo,Yo:DRAWXo,Y:DRAWX,Y:DRAWX,Y
o:DRAWXo,Yo
  550 ENDPROC
  560 :
  570 DEFPROCvars
  580 HI=HIMEM:K%(0)=8:w=&5E40:V=&5E38
  590 D=-4:P=0:Q=0:M=0:N=10:T=0:U=0
  600 sc=0:go=1:diff=Z%
  610 ENDPROC
  620 :
  630 DEFPROCchoice(C$,CH%)
```

All program listings in this issue can be downloaded FREE on...
MicroLink

```
  640 PRINTTAB(2,1)cl$
  650 PRINTTAB(10,1)C$
  660 REPEAT:G=GET-48:UNTIL G>0 AND G<CH
% OR G=35:PROCpeep
  670 ENDPROC
  680 :
  690 DEFPROCpeep
  700 SOUND1,-10,180,4
  710 ENDPROC
  720 :
  730 DEFPROCrnd(tot)
  740 FOR R=1 TO tot+1:d%(R)=R:NEXT R
  750 REPEAT:rnum=RND(tot)
  760 c%(tot)=d%(rnum)
  770 FOR R=rnum TO tot-1
  780 d%(R)=d%(R+1):NEXT R
  790 tot=tot-1:UNTIL tot=1:c%(1)=d%(1)
  800 ENDPROC
  810 :
  820 DEFPROCscr
  830 @%=0:VDU19,0,4;0;19,1,3;0;:COLOUR1
  840 PRINTTAB(1,1)"Level "lv%
  850 PRINTTAB(30,1)"Score "sc
  860 PROCquest:GCOL0,2:PROCmfr
  870 ENDPROC
  880 :
  890 DEFPROCquest
  900 X1=14:X2=23:fst=RND(9)
  910 IF lv%=1 fst=10
  920 IF lv%=2 fst=RND(9)
  930 IF lv%=3 AND fst<c%(go) fst=RND(9)
:GOTO930
  940 IF lv%=4 fst=10+RND(9)
  950 IF lv%=5 fst=RND(5)
  960 IF lv%=6 fst=5+RND(4)
  970 IF lv%=7 fst=RND(5)*c%(go)
  980 IF lv%=8 fst=(6+RND(4))*c%(go)
  990 COLOUR3
 1000 IF lv%=1 OR lv%=2 x$=CHR$225+sum$:
ans=fst+c%(go)
 1010 IF lv%=3 OR lv%=4 x$=CHR$226+sum$:
ans=fst-c%(go)
 1020 IF lv%=5 OR lv%=6 x$=CHR$227+sum$:
ans=fst*c%(go)
 1030 IF lv%>6  x$=CHR$228+sum$:ans=fst/
c%(go)
 1040 PRINTTAB(X1,1)"  "
 1050 IF LEN(STR$fst)=1 X1=X1+1
 1060 PRINTTAB(X1,1)STR$fst
 1070 PRINTTAB(17,1)x$:PRINTTAB(X2,1)"
"
 1080 PRINTTAB(X2,1)STR$ans
 1090 ENDPROC
 1100 :
 1110 DEFPROCnum
 1120 FOR num=1 TO 9
 1130 X=RND(38):Y=2+c%(num)*3
 1140 IF X=20 AND Y=20 GOTO1130
 1150 COLOUR 3:PRINTTAB(X,Y);num:NEXT nu
m
 1160 I=INKEY(500)
 1170 ENDPROC
 1180 :
 1190 DEFPROCplay
 1200 key=INKEY(7-sp*2)
```

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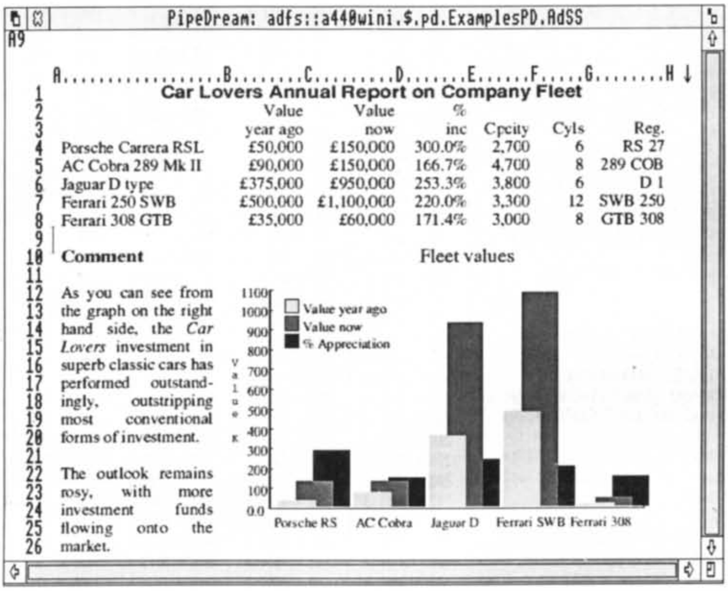
```
 1210 IF key=88 D=+8
 1220 IF key=90 D=-8
 1230 IF key=47 D=+4
 1240 IF key=58 D=-4
 1250 IF ABS(D)=8 w=w+D ELSE M=M+D
 1260 IF M=-4 w=w-640:M=4
 1270 IF M=+8 w=w+640:M=0
 1280 IF !(w+M)=&F0F0F0F0 PROCnok
 1290 IF !w<>0 AND !w<>&F0F0F0F0 GOTO138
0 ELSE !(w+M)=&F0F0F0F0
 1300 IF T>0 T=T-1:GOTO1360 ELSE !(V+U)=
0
 1310 IF diff=2 GOTO1200
 1320 IF ABS(K%(P))=8 V=V+K%(P) ELSE U=U
+K%(P)
 1330 IF U=-4 V=V-640:U=4
 1340 IF U=+8 V=V+640:U=0
 1350 P=P+1:IF P=100 P=0
 1360 Q=Q+1:IF Q=100 Q=0
 1370 K%(Q)=D:GOTO1200
 1380 Y=INT((w-HI)/640)
 1390 X=INT((w-HI-(Y*640))/16)
 1400 PRINTTAB(X,Y);:A%=135
 1410 I=((USR(&FFF4) AND &FF00)/&100)-48
 1420 IF I=c%(go) PROCok ELSE PROCnok
 1430 PRINTTAB(X,Y)" "
 1440 !(w+M)=&F0F0F0F0:N=N-1
 1450 IF N>0 GOTO1300 ELSE GOTO1200
 1460 ENDPROC
 1470 :
 1480 DEFPROCok
 1490 SOUND1,1,100+go*4,1:T=T+10:go=go+1
 1500 PROCscore(I)
 1510 ENDPROC
 1520 :
 1530 DEFPROCscore(N)
 1540 sc=sc+5*diff*sp:PROCupdate
 1550 COLOUR1:PRINTTAB(36,1)sc:COLOUR3
 1560 IFgo<10 PROCquest ELSE PROCall
 1570 ENDPROC
 1580 :
 1590 DEFPROCupdate
 1600 sc%(lv%)=sc
 1610 IF sc>hi%(lv%) hi%(lv%)=sc
 1620 ?(&37F+lv%)=sc%(lv%)
 1630 ?(&387+lv%)=hi%(lv%)
 1640 ENDPROC
 1650 :
 1660 DEFPROCall
 1670 CLS:sc=sc+5*diff*sp:PROCupdate
 1680 PROCfr(440,248,864,712):GCOL0,131:
VDU24,448;256;856;704;:CLG:VDU26:?&D3=25
5
 1690 PRINTTAB(15,14)"You got ALL"
 1700 PRINTTAB(17,16)"of them"
 1710 PRINTTAB(15,20)pr$
 1720 IF GET RUN
 1730 ENDPROC
 1740 :
 1750 DEFPROCnok
 1760 CLS:SOUND0,1,0,20:PROCupdate
 1770 GCOL0,1:PROCsq:GCOL0,0:PROCsq
 1780 RUN
 1790 ENDPROC
 1800 :
 1810 DEFPROCsq
 1820 Xo=640:Yo=512:X=660:Y=532:REPEAT:P
ROCfr(Xo,Yo,X,Y):Xo=Xo-32:Yo=Yo-32:X=X+3
2:Y=Y+32:UNTIL Xo=160
 1830 ENDPROC
 1840 :
 1850 DEFPROCload(F$)
 1860 ON ERROR:IF ERR=214 PRINTTAB(2,1)c
l$:PRINTTAB(2,1)"Can't find file "+F$:PR
INTTAB(27,1)pr$:IF GET:PRINTTAB(2,1)cl$:
GOTO90
 1870 IF L%=1 ENDPROC
 1880 PRINTTAB(6,1)"Load previous hiscor
```

►

PIPEDREAM 3



PipeDream: adfs::a440wini.$.pd.ExamplesPD.AdSS

A9

Car Lovers Annual Report on Company Fleet

	Value year ago	Value now	% inc	Cpcity	Cyls	Reg.
Porsche Carrera RSL	£50,000	£150,000	300.0%	2,700	6	RS 27
AC Cobra 289 Mk II	£90,000	£150,000	166.7%	4,700	8	289 COB
Jaguar D type	£375,000	£950,000	253.3%	3,800	6	D 1
Ferrari 250 SWB	£500,000	£1,100,000	220.0%	3,300	12	SWB 250
Ferrari 308 GTB	£35,000	£60,000	171.4%	3,000	8	GTB 308

Comment

As you can see from the graph on the right hand side, the *Car Lovers* investment in superb classic cars has performed outstandingly, outstripping most conventional forms of investment.

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MU1

All trademarks acknowledged. The chart in the screen shown above was produced by sending numbers from PipeDream 3 to Lingenuity's Presenter 2 and then loading the resulting graph back into PipeDream 3.

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```
es?":PROCyn:IF G$="Y" OSCLI("LOAD "+F$)
ELSE L%=1
 1890 ENDPROC
 1900 :
 1910 DEFPROCsave(F$)
 1920 PRINTTAB(6,1)"Save the hiscore tab
le?":PROCyn:IF G$="Y" OSCLI("SAVE "+F$+"
 "+STR$388+"+8")
 1930 ENDPROC
 1940 :
 1950 DEFPROCyn
 1960 PRINTTAB(30,1)"(Y/N)"
 1970 REPEAT:G$=GET$:UNTIL INSTR("YN",G$
)
 1980 PROCpeep:IF G$="Y":F$=FNin(7)
 1990 ENDPROC
 2000 :
 2010 DEF FNin(i%):LOCAL a$,i$,g%,len%
 2020 PRINTTAB(3,1)"Please enter the fil
e name":PRINTTAB(30,1)STRING$(i%,"*")
 2030 REPEAT REPEAT g%=GET:a$=CHR$g%:len
%=LENi$:IF len%=0 AND g%=13 VDU7:GOTO203
0
 2040 UNTIL g%=13 OR g%=127 OR (g%>47 AN
D g%<91):IF g%=13 OR g%=127 ELSE IF len%
=i% ELSE i$=i$+a$
 2050 PRINTTAB(30,1)i$:PROCpeep
 2060 IF g%=127 IF i$>"" PRINTTAB(29+len
%,1)"*":i$=LEFT$(i$,len%-1)
 2070 UNTIL g%=13 AND len%>0:=i$
```

Get it right

```
  10 =    0 0
  20 =    0 0
  30 =    0 0
  40 = E947 7
  50 = 4C6F A
  60 = 4477 6
  70 = 2FD3 E
  80 = B046 C
  90 = 2994 C
 100 = 66D8 E
 110 = FD2E 8
 120 = 9719 A
 130 = AF60 A
 140 = F610 A
 150 = C9F1 7
 160 = C823 2
 170 = 5A97 2
 180 = 7A1B C
 190 = CC8E B
 200 =  8FB 5
 210 = 3630 2
 220 = CBDD B
 230 = 717E 6
 240 = 1271 5
 250 = 3013 6
 260 = 3787 3
 270 = F9C8 5
 280 = F5B1 1
 290 = 3454 3
 300 = 18DC 6
 310 = 5786 7
 320 = 39B7 E
 330 = B1BC A
 340 = BE7B 1
 350 = C44E E
 360 = 7791 9
 370 = F5BF D
 380 = AE85 A
 390 = 90EA 6
 400 = 52B2 4
 410 = 7B17 1
 420 = 5D2D 3
 430 = C5A7 B
 440 = 7A16 E
 450 = EDOF D
 460 = 9719 6
 470 = 42DE 7
 480 = 3E1A 3
 490 = 76A2 E
 500 =  83D 6
 510 = EDOF 6
 520 = 9719 8
 530 = FD59 7
 540 = A706 9
 550 = EDOF F
 560 = 9719 7
 570 = 785A 4
 580 = BFAE 0
 590 = 8014 1
 600 = 87D8 9
 610 = EDOF 5
 620 = 9719 D
 630 = A5E9 7
 640 = 1E2E 7
 650 = A03B 5
 660 = FE5C A
 670 = EDOF B
 680 = 9719 C
 690 = 2984 1
 700 = D4D2 F
 710 = EDOF D
 720 = 9719 3
 730 = FB9D A
 740 = BFA7 7
 750 = 7C83 6
 760 = 904C 2
 770 = 3CBB 5
 780 = 5C05 4
 790 = DBCF 2
 800 = EDOF 0
 810 = 9719 1
 820 = E549 F
 830 = 2E9C A
 840 = 49B4 3
 850 = B1FE 9
 860 = B844 2
 870 = EDOF D
 880 = 9719 A
 890 = EBFD 4
 900 = AE66 1
 910 = 4305 C
 920 = 6921 B
 930 = 75C3 6
 940 = A856 4
 950 = 30B6 F
 960 = C18F 9
 970 = 2B8E D
 980 = 38C8 C
 990 = C90B D
1000 = E4AC 3
1010 = D113 3
1020 = F5B4 4
1030 = 52C1 F
1040 = 160C 5
1050 = A69F 3
1060 = 2A80 B
1070 = B6DC 4
1080 = 62AD 7
1090 = EDOF E
1100 = 9719 D
1110 = AE70 0
1120 =  AFE E
1130 = 86A3 B
1140 = B416 0
1150 = 2885 7
1160 = 9FD9 A
1170 = EDOF 5
1180 = 9719 7
1190 = EAF8 0
1200 = D09F 0
1210 =  C37 2
1220 = 13B2 D
1230 = 5AD3 D
1240 = 8D17 C
1250 = D9A7 9
1260 = B2CF C
1270 = 7710 8
1280 = D3E9 4
1290 = E0F8 E
1300 = 850D 6
1310 = E8D3 8
1320 = 2592 C
1330 = 546E 1
1340 = 91B1 1
1350 = 1A5F 8
1360 = 7852 F
1370 = 471B 4
1380 = A331 A
1390 = 61DB 5
1400 = 8924 1
1410 = 487D F
1420 = 108C B
1430 = 4771 6
1440 = A370 0
1450 = D311 3
1460 = EDOF 8
1470 = 9719 B
1480 = DA6E F
1490 = 6F93 E
1500 = CA1E A
1510 = EDOF 6
1520 = 9719 A
1530 = D90A A
1540 = 4571 9
1550 = EB3D 7
1560 = 6F8B B
1570 = EDOF 5
1580 = 9719 6
1590 = F307 8
1600 = CCDF 0
1610 = AB79 0
1620 = A8CD 1
1630 = 9EE9 2
1640 = EDOF 7
1650 = 9719 D
1660 = 2B8B 7
1670 = 2A71 9
1680 = 8281 9
1690 = B074 E
1700 = 8D0C F
1710 =  994 A
1720 = 452A A
1730 = EDOF E
1740 = 9719 5
1750 = 220E 6
1760 = D61A 2
1770 = 29DD 0
1780 = 7E36 3
1790 = EDOF 1
1800 = 9719 5
1810 = 2F0B D
1820 = 2FB0 0
1830 = EDOF E
1840 = 9719 B
1850 = 15FA 5
1860 = 1DBE A
1870 = 9FD4 F
1880 = 6E38 1
1890 = EDOF 8
1900 = 9719 D
1910 = BB90 1
1920 = E1D0 F
1930 = EDOF 3
1940 = 9719 7
1950 = 231E A
1960 = FEFC 0
1970 = 80F1 D
1980 = 4F14 1
1990 = EDOF 7
2000 = 9719 3
2010 = 32BB 1
2020 = 58BA 3
2030 = F304 4
2040 = EB2E E
2050 =  B16 3
2060 = 1651 E
2070 = 8D9E F
```

New fonts New fonts New fonts
New fonts New fonts
New fonts New fonts

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We've got it taped

£10 Prize letter

A PANEL in your February issue said that there would be holes for the golf game on the subscription disc, so I was surprised to find some on the tape that arrived with my magazine – thanks for not forgetting cassette users.

However each hole consists of two files and these are the wrong way round on the tape for easy use. Also the files have directories in their names and, unlike discs, these need actually stating.

The cure is simple. Remove line 620 and change the following:

```
610 *OPT 1,0
630 ch=OPENIN("a."+T$)
655 OSCLI("LOAD "+"$."+T$+" 4
68E")
```

*Note that the *OPT 1,0 switches off all cassette messages like searching so that the screen is not corrupted.*

It's a good idea to wind the tape to near the start of the files before running the golf game – you'll know they're loading even with no messages because you'll see the screen drawing.

Finally, although it doesn't affect me or most other users, there is an OSCLI in line 610 – now 655. This will prevent the program working on Basic I micros.

If the line is listed from the monthly disc or tape it's not even displayed. As with all programs containing OSCLI, the cure is to use a procedure to make the call – PROCoscli.

In the case of Golf, line 610 should read:

```
610 PROCoscli("LOAD "+"+T$+
" 468E")
```

If you have made the above changes for tape, alter 655 instead. Next, put the following routine at the end of the program:

```
5000 DEF PROCoscli($&700)
5010 LOCAL X%,Y%
5020 Y%=7:CALL &FFF7
5030 ENDPROC
```

With these changes, Golf is a super game that will work on any 8 bit BBC Micro – tape or disc, Basic 1 or Basic 2. – **B. McNally, Troon, Scotland.**

YES Balls!

THE Balls! game that was reviewed in your March issue looked great fun so I tried to obtain a copy from the supplier listed – Audiogenic.

I was told that the game was not, in fact, theirs and is published by YES. Could you please let me know the address of YES? – **P. Reader, Stockport, Cheshire.**

● *The Balls disc costs £5 and is available by mail order only from YES Marketing, QEH, Jacobs Wells Road, Bristol BS8 1JX.*

Get it right!

AFTER I had typed in the whole of the Checksum program for the BBC Micro from the February edition I noticed that the cli procedure was not complete.

As I'm not very experienced with machine code I didn't know how to finish it, so please could you print it. – **Daniel Elphick, Oxford.**

● Unfortunately one line fell off the end of the listing. It is:

```
1460 Y%=7:CALL &FFF7:ENDPROC
```

DTP program debugged

MY attention has been draw to a bug in the mode conversion section of the Database DTP program of which I am the author.

If you already have the software you can most easily solve it by inserting the DTP program disc in your drive and typing:

```
LOAD"Conv"
```

If you then list the program you will find the following line at the end:

```
1000 DEFPROCinit:s$=STRINGS
(79," ")+STRINGS$(79,CHR$8):
format%=a%:a%=2:COLOUR0:COL
OUR129:PRINTTAB(0,0)s$TAB(0
,31)s$TAB(0,31)s$;:PROCo"LO
AD CONVERT 1500":ENDPROC
```

Unfortunately the brackets have been omitted from around the parameters in the call to PROCo, and this causes the program to hang with a Missing parameters *error.*

If the line is copied and the missing brackets inserted, as in the line following, the program will function correctly:

```
PROCo("LOAD CONVERT
1500"):ENDPROC
```

I apologise to all those who have been inconvenienced by this oversight. – **Kendall K. Down, Rhyl, Clwyd.**

Win a tenner

WANT to write to The Micro User? The addess is: Letters, The Micro User, Europa House, Adlington Park, Adlington, Macclesfield, SK10 4NP.

Writers of the most interesting letters receive a £10 prize.

No stop

THANK you for publishing my letter in the February issue of The Micro User.

There is however a small error in the listing: The comma following Tog on line 590 needs to be a full stop for the program to function.

The corrected line is:

```
590 DATA Set up, Filing, E
dit label, Print label, To
g. Strike, Quit
```

– **Frank Chaplin, Withnell, Lancs.**

Crashing breaks

RECENTLY on my BBC B I discovered a simple method of making the machine crash on any kind of Break sequence.

*It is enforced by three simple osbyte calls which can be made as *FX commands:*

```
*FX 247,76
*FX 248,12
*FX 249,0
```

To crash the machine either Break has to be pressed or a CALL !-4 command can be issued from within a program.

Take care with this routine because it will lose the entire

➤

A healthy interest for education

IT was with great interest that I read Ian Whitmore's article on Healthdata – The Micro User, *January 1990. I realise in such a short article the many features of such a wide ranging resource cannot be fully explored, but I would urge any educationalist to delve into this excellent database further.*

As the curriculum examines health and health-related social issues, such a source of information cannot be praised too highly.

The Belfast Education and Library Board include the pages of Healthdata on its own viewdata service, BelView.

This is available 24 hours a day and has five lines. From Northern Ireland this system can be accessed on 0232 325778 using any Prestel-compatible software, and the Healthdata pages can be explored by entering:

```
*HEALTH#
```

Many teachers will find the paralleled comparison of health and financial implications of alcohol and tobacco of particular interest. – **D.P. Barr, Asst. Education Officer, Belfast Education and Library Board, Belfast**

ALL programs printed in this magazine are exact reproduction of listings taken from running programs which have been thoroughly tested.

However, on the rare occasions when mistakes occur corrections are published as a matter of urgency. Should you encounter error messages when you type in a program, they will almost certainly be the result of your own typing mistakes.

Unfortunately we cannot answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the letters pages.

➤

contents of the ram and will result in the machine having to be turned off and back on again. – **S.Bloom, Stanmore, Middlesex.**

● Although this routine works on your machine it does not work properly on the Master series. A better solution is to use:

```
PX=&287
[JMP &287]
*FX 247,76
*FX 248,135
*FX 249,2
```

as this is compatible with the full range of BBC B, B+, Master and Compact.

Colour printing

I HAVE just bought a Star LC10C colour dot matrix printer and have found the manual very poor.

It is mainly written for the IBM PC range and says that LPRINT is used to produce different effects with various other commands following it. However my BBC B always prints Syntax Error *when I try them.*

Could you please tell me the BBC Micro equivalent of these commands?

Also will a Desktop Publisher solve my problems? – **J. L. Amphett, Malvern, Worcs.**

● LPRINT is used on a lot of micros to output to the printer but the BBC Micro has a much more structured approach.

On the BBC Micro output can be sent to various "streams" controlled mainly by *FX3.

After *FX3,10 it is sent to the printer so just put this command at the start of any routine in your manual and use PRINT in place of LPRINT. At the end, put *FX3,4 to switch back to the screen.

So, for example, in place of:

```
LPRINT CHR$(27);"W";CHR$(1)
```

you should use:

```
*FX3,10
PRINT CHR$(27);"W";CHR$(1)
*FX3,4
```

Any DTP package – or even a good word processor – gives easy access to type styles, but only in mono. To dump colour pictures you should look at Snatch by 4Mation.

Still Exiled by line 80

I TRIED typing in the Exile hint decoding program from the January issue – but it doesn't seem to work. I've checked everything as carefully as possible but I can't see any error of my own. Can you help? – **Xavier Courtney, Wilmslow, Cheshire.**

● Unfortunately an early version was published and line 80 is in error. It should read:

```
80 text?A%=text?A%+
(text?A%>64)
```

This should give you the right answers.

Down in the caverns

The review of Caverns from Minerva in your February issue is, I feel, completely unjustified in its sarcastic criticism

The reviewer's main concern was with the inability to get very far. Is this a good enough reason to mark it down? Perhaps the general buying public would fare better – I certainly did.

However certain comments I will agree with. By not giving suitable information concerning game play and objects you add to the difficulty of the game, but in a frustrating and useless way.

So I've enclosed a couple of hints with this letter. Is it worth more than six? Yes, if you like really hard games which take a lot of time and effort to complete. – **Christopher Trueman, Bristol,**

● We've pased the hints to Hacman for checking out and they'll be appearing in his column soon.

Jumping around easily

I AM working on a program where it is necessary to jump between the different files on disc using the CHAIN command in the program listings to do this. I was wondering if it is possible using this method to instruct the computer to go to line 200 of a program, thereby missing out lines 10-190. – **John Williams, Altrincham, Cheshire.**

● We can't see the point of always going to line 200 when a program starts – it would imply that it has been very badly written and GOTO200 in the first line would achieve the desired result.

However, you may want to jump to a certain point in a second program, depending on what happened in the first.

The resident integer variables – A% to Z% – are preserved between programs, so a method could be based on them. For example, *L%* could be set up in the first program and an early line in the second could be something like:

```
ON L% GOTO 100,200,300,400
```

Flavour of the month

DESPITE a very limited budget, I have managed to build up quite a respectable library of serious software ranging from the excellent Fun School 2 – for my kids – up to the likes of Computer Concept's Inter-series.

Hardware expansion has been a slow and expensive excercise, with some looks at the second hand market.

The only utility which I coverted was a decent CAD

Keeping the worksheets to time

ON the January subscription disc you put some maths worksheet generating software and this gave me the idea for a program that will ask 100 sums and at the end print out the results.

I wrote it, but can't get the micro to give the person playing the game a time limit.

If I could do this the program could be used in schools so that teachers would not have to write out tests to find out how good the students are.

Please can you help me with this problem? – **Drew Reed (age 12), Aylesbury, Bucks.**

● There is a built-in system variable *TIME* in the BBC Micro.

This starts at zero when the micro is switched on and increments by one every hundredth of a second. Try:

```
PRINT TIME/100
```

This shows how long the micro has been switched on in seconds.

So to allow a time limit in to your program use a method like the one shown in the demonstration routine below.

This starts an on-screen second timer when you press a key and beeps five seconds later.

```
10 CLS
20 PRINT"PRESS A KEY"
30 Key=GET
40 TIME=0
50 REPEAT
60 PRINT TAB(10,10)TIME DIV
100
70 UNTIL TIME>500
80 VDU7
```

program. They were too expensive to justify to my wife, so I did without. Enter Pineapple with Diagram II reduced to £25. Too good to pass so out came the plastic.

The package is quite simply amazing, and without doubt the best buy I have made since I bought my BBC Micro. A comprehensive manual written in simple English complements a virtually idiot proof – I should know – piece of software which is breathtakingly effective.

A true work of genius if ever I saw one. Thank you, Pineapple and hats off to the author J. F. Daniels – **Paul Downs, Anfield, Liverpool.**

Spinner instructions

FIRSTLY, thank you for an interesting magazine which is excellent value, especially with a subscription. I recommend one wholeheartedly because a collection of good programs and utilities is built up over the months and it is convenient to have them typed-in and ready to use.

The Spinner graphics demo in the December 1989 issue is certainly very effective, but the documentation seems to have missed out the fact that the following keypreses can be made:

```
< Spin ball to left
> Spin ball to right
$ To stop the ball
^ Speed up the spinning
v Slow the spinning down
```

– **Daniel Hope, Kent.**

Wrong character

I HAVE typed in the Stratagem game from your March issue, and although I'm sure I have typed it in exactly as printed I can't get the checksums of lines 70,140 and 200 to match.

Could you please tell me if the ` is the character obtained with Shift+7, or is there another similar one that I've not noticed on my keyboard?– **Paul Evanson, Stockport, Cheshire.**

● Unfortunately, the printer we used to output the listings produced character 96 – the BBC Micro £ – as an apostophe facing backwards. So the correct character is £ and the lines should read:

```
70 £$=CHR$150+STRING$$(39,
"£")
140 PRINTTAB(0,0)£$
200 PRINTTAB(0,20)£$
```

Sprite editing

IN the December 1989 issue Drew Knight asked about Acornsoft sprites. Full details can be found in the Acornsoft GXR manual pages 52 to 58 with some examples afterwards. A summary of the instructions is below.
I hope this helps. – **Gerald Holdsworth, Bexley Heath, Kent.**

```
        *SEDIT n : Edits sprite n
            COPY : Block colour 7
          DELETE : Block color 0
              f0 : Pen down
              f1 : fill row
              f2 : Fill column
              f3 : Extend vertically
        Shift+f3 : Reduce vertically
              f4 : Extend horizontally
        Shift+F4 : Reduce horizontally
              f5 : Insert row
        Shift+f5 : Delete row
              f6 : Insert column
        Shift+f6 : Delete column
              f7`: Mirror vertically
              f8 : Mirror horizontally
  *SLOAD filename : Loads a sprite file
  *SSAVE filename : Saves the current sprites
 *SMERGE filename : Merges new file with current sprites
      *SEDIT n,m : Edits sprite n as m
  *SRENUMBER n,m : Changes sprite n to m
*SDELETE n,o,p... : Deletes 1 or more sprites
           *SNEW : Deletes all sprites
      *SCHOOSE n : Chooses a sprite for next plot action.
  PLOT &E8 to &EF : Plots sprite according to current GCOL action.
    VDU23,27,0,n| : Same as *SCHOOSE
         *SGET n : Gets a sprite from sereen box with corners
                   defined by last two graphics positions.
    VDU23,27,1,n| : Same as *SGET.
```

Making a good Impression

I HAVE been reading The Micro User since August 1983 when I bought my first micro – a BBC B – and I have always found much of interest in its pages. Now I also have an Archimedes the magazine has plenty for both my micros.

I work in publishing and part of my work involves preparing leaflets for use both within and outside the company. Our in-house typesetting facilities are often overworked, and this leads to delays and inconvenience.

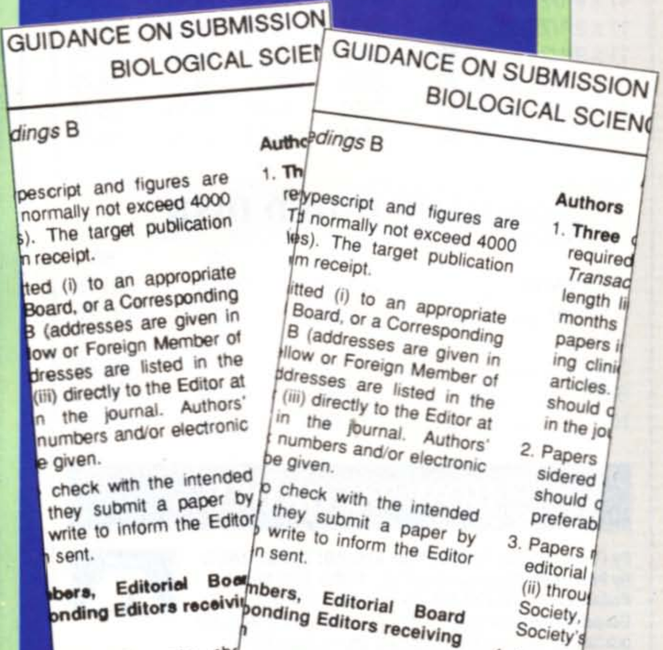
Recently I have become very interested in DTP and, with only 1Mb of memory in my Archimedes at home, I was eager for Impression to appear. I obtained it, and not long after a rush job came up at work calling for a two-sided leaflet with some repetition and careful layout – ideal material, I thought, for me to set up at home and avoid the queue.

After an evening's work I printed out the proofs on my dot matrix printer, had them checked the next day, and corrected them that evening.

I don't have access to a laser printer, so I printed the document to disc as a PostScript file and sent it the following day to our printer, where it was transferred via a PC to a high quality PostScript typesetting machine at over 2,000 dots per inch.

So, within a couple of days of starting the job it was ready for printing and the layout was completely under my control rather than having to be cut and pasted by someone else, which would have taken well over a week.

The samples show that the output matched the proofs exactly, except for the much higher quality. The only trouble is that the temptation is now strong for me to do all this sort of work at home. – **J. Whelan, Wimbledon, London.**



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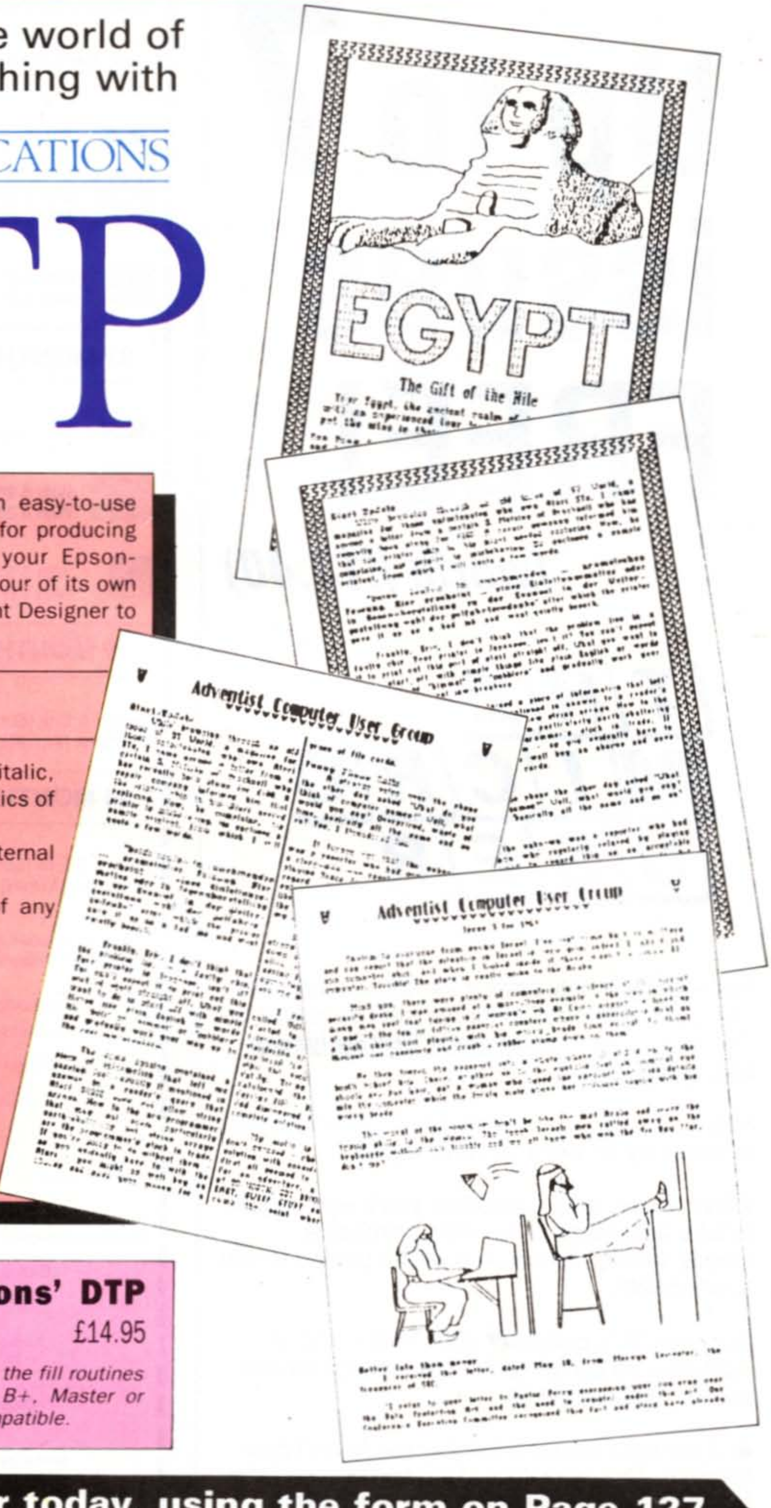

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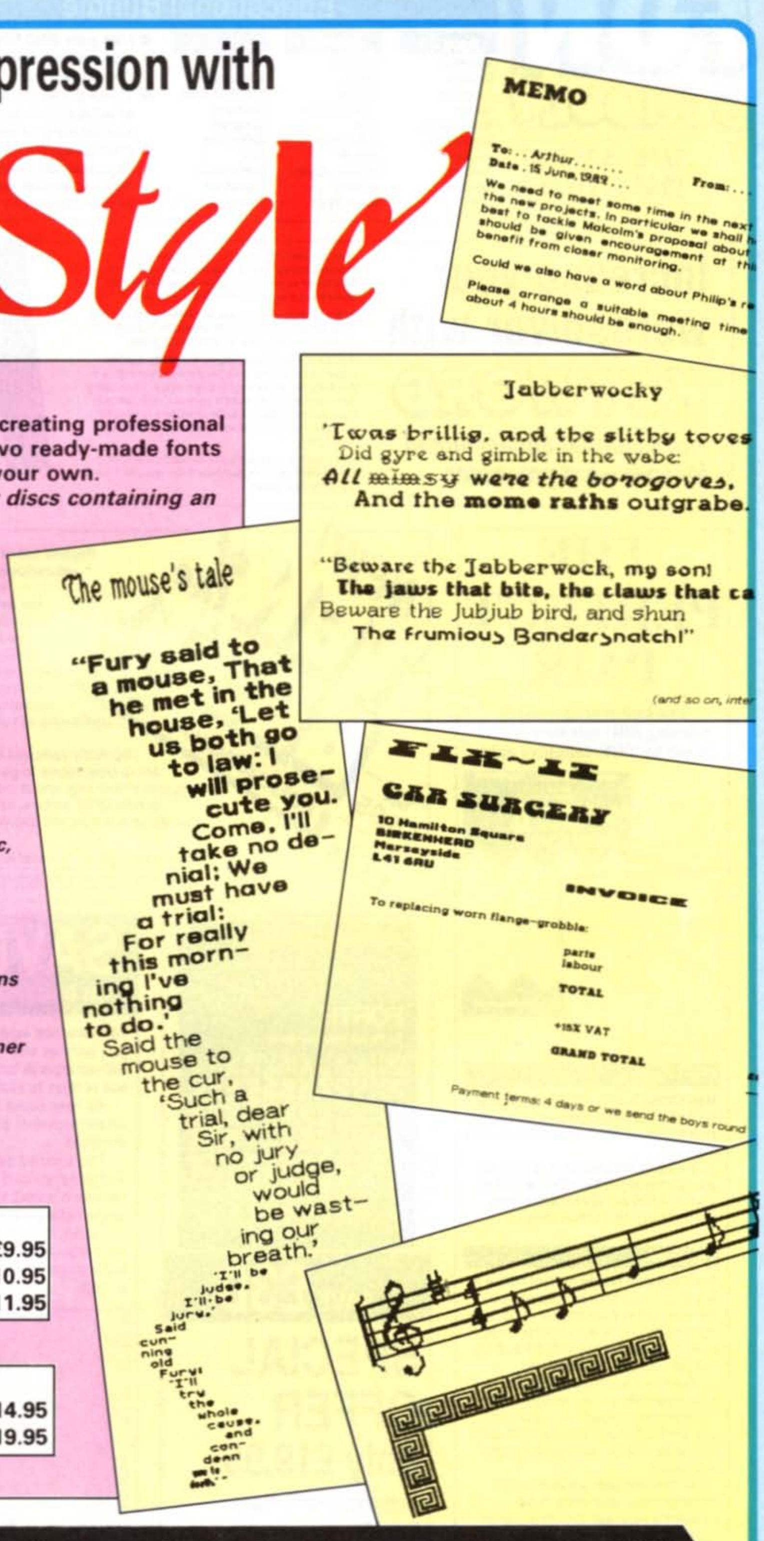

MEMO

To: . . Arthur. . . . . . .
Date . 15 June, 1989 . . .
From: . . .

We need to meet some time in the next
the new projects. In particular we shall h
best to tackle Malcolm's proposal about
should be given encouragement at thi
benefit from closer monitoring.

Could we also have a word about Philip's re

Please arrange a suitable meeting time
about 4 hours should be enough.

Jabberwocky

'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe:
All mimsy were the borogoves,
And the mome raths outgrabe.

"Beware the Jabberwock, my son!
The jaws that bite, the claws that ca
Beware the Jubjub bird, and shun
The frumious Bandersnatch!"

(and so on, inte

The mouse's tale

"Fury said to
a mouse, That
he met in the
house, 'Let
us both go
to law: I
will prose-
cute you.
Come, I'll
take no de-
nial; We
must have
a trial:
For really
this morn-
ing I've
nothing
to do.'
Said the
mouse to
the cur,
'Such a
trial, dear
Sir, with
no jury
or judge,
would
be wast-
ing our
breath.'
'I'll be
judge,
I'll be
jury,'
Said
cun-
ning
old
Fury!
'I'll
try
the
whole
cause,
and
con-
demn
[illegible]
death.'"

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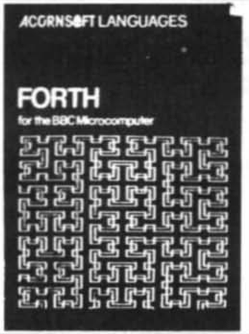

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(see page 116)

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(see page 78)

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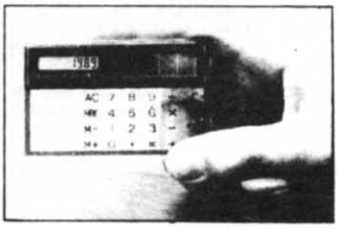

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◀ From Page 91

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```
   70 MODE7
   80 PRINT 'title$;'title$''
   90 pad$=CHR$(131)+"   "
  100 PRINT pad$;"1) from Wordwise / Wor
dwise Plus"
  110 PRINT pad$;"2) from Mini Office II
"
  120 PRINT '" Enter choice";CHR$(134);
  130 REPEAT:opt$=GET$:UNTIL INSTR("12",
opt$)
  140 PRINT opt$
  150 IF opt$="1" THEN term%=7:tab%=&DD:
CO$="CO":FI$="FI":JO$="JO":NJ$="NJ" ELSE
 term%=3:tab%=9:CO$="PO":FI$="IR":JO$="F
J":NJ$="RR"
  160 PRINT ''pad$;"1) to VIEW"
  170 PRINT pad$;"2) to InterWord"
  180 PRINT '" Enter choice";CHR$(134);
  190 REPEAT:option$=GET$:UNTIL INSTR("1
2",option$)
  200 PRINT option$
  210 PRINT ''" Name of file to convert:
";CHR$(134);
  220 INPUT "" source$
  230 H%=OPENIN(source$)
  240 IF H%=0 THEN PRINT 'CHR$(136);CHR$
(129);"File does not exist, try again":G
OTO 210
  250 PRINT '" Name of file to create: "
;CHR$(134);
  260 INPUT "" dest$
  270 IF option$="1" THEN D%=OPENOUT(des
t$) ELSE D%=OPENOUT("!?!?!?!")
  280 ce%=0:in%=0:lm%=0:rm%=70:pb%=0:ts%
=-1:bs%=-1:hp%=-1:fp%=-1:pl%=-1:ls%=-1:u
l%=0:bo%=0:tno%=0:N%=0:F%=0
  290 IF option$="1" THEN PROCvhead ELSE
 PROCiwhead
  300 w$=""
  310 ON ERROR GOTO 500
  320 REPEAT
  330 FOR G%=in%+1 TO rm%
  340 IF F%<>0 THEN F%=F%-1:GOTO 460
  350 B%=BGET#H%
  360 IF B%=2 THEN N%=G%:G%=G%-1:PROCwor
d:PROCembed:GOTO 460
  370 IF B%=13 THEN PROCword:F%=-1:GOTO
460
  380 IF B%<>tab% THEN GOTO 430
  390 pos%=-1:IF tno%=0 THEN GOTO 460
  400 REPEAT:pos%=pos%+1:UNTIL trule%(po
s%)>G%
  410 IF trule%(pos%)<rm% THEN PROCword:
BPUT#D%,9:F%=trule%(pos%)-G%:GOTO 460
  420 PROCword:PROCeline:BPUT#D%,9:G%=tr
ule%(0):GOTO 460
  430 IF B%<>32 THEN w$=w$+CHR$(B%):GOTO
 460
  440 PROCword
  450 BPUT#D%,32
  460 NEXT
  470 F%=0:PROCeline
  480 UNTIL EOF#H%
  490 :
  500 PROCword:PTR#D%=PTR#D%-1:BPUT#D%,1
3:CLOSE#0
  510 IF option$="1" THEN END
  520 ON ERROR GOTO 590
  530 S%=OPENIN("!?!?!?!"):D%=OPENOUT(de
st$)
  540 FOR I%=1 TO &336:BPUT#D%,BGET#S%:N
EXT
  550 REPEAT
  560 B%=BGET#S%:IF B%=&EE THEN B%=128+B
GET#S%
  570 BPUT#D%,B%
  580 UNTIL EOF#S%
  590 BPUT#D%,&81:BPUT#D%,0:BPUT#D%,&87:
BPUT#D%,&FF:BPUT#D%,&FF
  600 lb%=(PTR#D%-1) MOD 256:hb%=(PTR#D%
-1) DIV 256
  610 PTR#D%=&34:BPUT#D%,lb%:BPUT#D%,hb%
  620 CLOSE#0:*DELETE !?!?!?!
  630 END
  640 :
  650 DEFPROCpar
  660 code$=CHR$(BGET#H% AND &DF)+CHR$(B
GET#H% AND &DF)
  670 IF code$="DH" OR code$="DF" THEN R
EPEAT:UNTIL BGET#H%=13:ENDPROC
  680 IF code$="DT" THEN GOTO 750
  690 par$=""
  700 REPEAT
  710 B%=BGET#H%:IF B%<>32 THEN par$=par
$+CHR$(B%)
  720 UNTIL B%=term% OR B%=13 OR B%=2 OR
 EOF#H%
  730 par$=LEFT$(par$,LEN(par$)-1)
  740 GOTO 840
  750 tno%=0:no$=""
  760 REPEAT
  770 B%=BGET#H%
  780 IF B%=32 OR B%=term% OR B%=2 OR B%
=13 THEN GOTO 810
  790 IF B%=ASC"," THEN trule%(tno%)=VAL
(no$):tno%=tno%+1:no$="":GOTO 810
  800 no$=no$+CHR$(B%)
  810 UNTIL B%=term% OR B%=13 OR B%=2
  820 IF no$<>"" THEN trule%(tno%)=VAL(n
o$):tno%=tno%+1
  830 trule%(tno%)=5000
  840 IF B%=2 THEN PTR#H%=PTR#H%-1
  850 ENDPROC
  860 :
  870 DEFPROCiruler
  880 BPUT#D%,&85:BPUT#D%,&86
  890 BPUT#D%,lm%+in%:BPUT#D%,(lm%+rm%):
BPUT#D%,lm%+in%
  900 BPUT#D%,0:BPUT#D%,0
  910 IF tno%=0 THEN GOTO 960
  920 FOR I%=0 TO tno%-1
  930 IF trule%(I%)-in%>127 OR trule%(I%
)<in% THEN GOTO 950
  940 BPUT#D%,(trule%(I%)+lm%-in%-1)
  950 NEXT
  960 BPUT#D%,&87
  970 ENDPROC
  980 :
  990 DEFPROCvruler
 1000 BPUT#D%,&81:BPUT#D%,ASC".":BPUT#D%
,ASC"."
 1010 J%=-1
 1020 REPEAT:J%=J%+1:UNTIL trule%(J%)>in
%
 1030 FOR I%=in%+1 TO rm%-1
 1040 IF I%=trule%(J%) THEN BPUT#D%,ASC"
*":J%=J%+1 ELSE BPUT#D%,ASC"."
 1050 NEXT
 1060 BPUT#D%,ASC"<":BPUT#D%,13
 1070 F%=-1
 1080 ENDPROC
 1090 :
 1100 DEFPROCembed
 1110 PROCpar
 1120 IF option$="1" THEN PROCvembed ELS
E PROCiembed
 1130 ENDPROC
 1140 :
 1150 DEFPROCvembed
 1160 IF N%=in%+1 THEN N%=0 ELSE N%=1
 1170 IF code$="BP" THEN PROCcommand("PE
"):ENDPROC
 1180 IF code$="CE" THEN PROCcommand("CE
"):PTR#D%=PTR#D%-1:ENDPROC
 1190 IF code$="CI" THEN in%=0:PROCcomma
nd("LM"+STR$(lm%)):PROCvruler:ENDPROC
 1200 IF code$=CO$ THEN PROCcommand("PBO
FF")
 1210 IF code$="CP" THEN PROCcommand("PE
"+par$):ENDPROC
 1220 IF code$="DT" THEN PROCvruler:ENDP
ROC
 1230 IF code$="EP" THEN PROCcommand("PB
ON"):ENDPROC
 1240 IF code$=FI$ THEN PROCcommand("RJ"
):PTR#D%=PTR#D%-1:ENDPROC
 1250 IF code$="IN" THEN in%=VAL(par$):P
ROCcommand("LM"+STR$(in%+lm%)):PROCvrule
r:ENDPROC
 1260 IF code$="LL" THEN rm%=VAL(par$):P
ROCvruler:ENDPROC
 1270 IF code$="LM" THEN lm%=VAL(par$):P
ROCcommand("LM"+par$):ENDPROC
 1280 IF code$="LS" THEN ls%=VAL(par$):P
ROCcommand("LS"+STR$(ls%-1)):ENDPROC
 1290 IF code$="PL" THEN pl%=VAL(par$):P
ROCcommand("PL"+par$):ENDPROC
 1300 IF code$="SP" THEN FOR I%=0 TO VAL
(par$):BPUT#D%,13:NEXT:G%=in%:ENDPROC
 1310 IF code$="SS" THEN ls%=1:PROCcomma
nd("LS0"):ENDPROC
 1320 IF code$="TI" THEN BPUT#D%,13:FOR
I%=1 TO VAL(par$):BPUT#D%,32:NEXT:G%=VAL
(par$):ENDPROC
 1330 IF code$="UE" THEN ul%=0:N%=0:BPUT
#D%,&1C:ENDPROC
 1340 IF code$="DE" THEN bo%=0:N%=0:BPUT
#D%,&1D:ENDPROC
 1350 IF code$="TS" ts%=VAL(par$):PROCvl
ayout:ENDPROC
 1360 IF code$="BS" bs%=VAL(par$):PROCvl
ayout:ENDPROC
 1370 IF code$="HP" hp%=VAL(par$):PROCvl
ayout:ENDPROC
 1380 IF code$="FP" fp%=VAL(par$):PROCvl
ayout:ENDPROC
 1390 IF opt$="2" THEN GOTO 1420
 1400 IF code$="US" THEN ul%=1:N%=0:BPUT
#D%,&1C:ENDPROC
 1410 IF code$="DS" THEN bo%=1:N%=0:BPUT
#D%,&1D:ENDPROC ELSE GOTO 1460
 1420 IF code$<>"DS" THEN GOTO 1440
 1430 IF VAL(par$)=0 THEN bo%=0:N%=0:BPU
T#D%,&1D:ENDPROC ELSE bo%=1:N%=0:BPUT#D%
,&1D:ENDPROC
 1440 IF code<>"UL" THEN GOTO 1460
 1450 IF VAL(par$)=0 THEN ul%=0:N%=0:BPU
T#D%,&1C:ENDPROC ELSE ul%=1:N%=0:BPUT#D%
,&1C:ENDPROC
 1460 N%=0:ENDPROC
 1470 :
 1480 DEFPROCcommand(string$)
 1490 IF N%=1 THEN BPUT#D%,13
 1500 BPUT#D%,&80
 1510 FOR I%=1 TO LEN(string$)
 1520 BPUT#D%,ASC(MID$(string$,I%,1))
 1530 NEXT
 1540 BPUT#D%,13
 1550 ENDPROC
 1560 :
 1570 DEFPROCvhead
 1580 PROCcommand("PBOFF")
 1590 PROCcommand("TM2")
 1600 PROCcommand("HM3")
```

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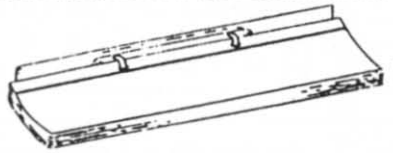

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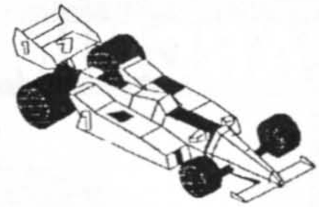

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```
 1610 PROCcommand("FM2")
 1620 PROCcommand("BM3")
 1630 PROCcommand("DF//PAGE |P//")
 1640 ts%=6:bs%=6:fp%=3:hp%=3:tm%=2:hm%=
3:fm%=2:bm%=3
 1650 BPUT#D%,&81
 1660 FOR I%=1 TO 71:BPUT#D%,ASC".":NEXT
 1670 BPUT#D%,ASC"<":BPUT#D%,13
 1680 ENDPROC
 1690 :
 1700 DEFPROCvlayout
 1710 IF N%=1 THEN BPUT#D%,13
 1720 IF hp%>ts% THEN hp%=ts%
 1730 IF fp%>bs% THEN fp%=bs%
 1740 IF hp%-1<>tm% THEN tm%=hp%-1:PROCc
ommand("TM"+STR$(tm%))
 1750 IF ts%-hp%<>hm% THEN hm%=ts%-hp%:P
ROCcommand("HM"+STR$(hm%))
 1760 IF fp%-1<>fm% THEN fm%=fp%-1:PROCc
ommand("FM"+STR$(fm%))
 1770 IF bs%-fp%<>bm% THEN bm%=bs%-fp%:P
ROCcommand("BM"+STR$(bm%))
 1780 ENDPROC
 1790 :
 1800 DEFPROCeline
 1810 IF option$="1" THEN GOTO 1860
 1820 IF B%=13 OR B%=tab% THEN BPUT#D%,1
3
 1830 IF ce%=1 THEN ce%=0:BPUT#D%,23
 1840 BPUT#D%,&EE
 1850 ENDPROC
 1860 IF N%=0 THEN BPUT#D%,13 ELSE N%=0
 1870 IF ul%=1 THEN BPUT#D%,&1C
 1880 IF bo%=1 THEN BPUT#D%,&1D
 1890 ENDPROC
 1900 :
 1910 DEFPROCword
 1920 IF LEN(w$)=0 THEN ENDPROC
 1930 FOR J%=1 TO LEN(w$)
 1940 BPUT#D%,ASC(MID$(w$,J%,1))
 1950 NEXT
 1960 w$=""
 1970 ENDPROC
 1980 :
 1990 DEFPROCiwhead
 2000 REPEAT
 2010 IF BGET#H%=2 THEN PROCpar:PROCchec
k
 2020 UNTIL EOF#H%
 2030 IF pl%<0 THEN pl%=66
 2040 IF ls%<0 THEN ls%=1
 2050 IF bs%<0 THEN bs%=6
 2060 IF ts%<0 THEN ts%=6
 2070 IF hp%<0 THEN hp%=3
 2080 IF fp%<0 THEN fp%=3
 2090 PTR#H%=0
 2100 FOR G%=1 TO 13:READ A$:BPUT#D%,(12
8+ASC(A$)):NEXT
 2110 BPUT#D%,1
 2120 PROCzero(24):PROCdata(24)
 2130 BPUT#D%,(hp% DIV ls%)
 2140 BPUT#D%,(ts% DIV ls%)
 2150 BPUT#D%,((pl%-bs%) DIV ls%)
 2160 BPUT#D%,((pl%-bs%+fp%) DIV ls%)
 2170 BPUT#D%,((pl% DIV ls%)+1)
 2180 PROCdata(6):BPUT#D%,pb%
 2190 PROCdata(30):PROCzero(32)
 2200 FOR G%=1 TO LEN(dest$):BPUT#D%,ASC
(MID$(dest$,G%,1)):NEXT
 2210 BPUT#D%,13:PROCzero(95-LEN(dest$))
 2220 FOR G%=1 TO 3:BPUT#D%,&AA:NEXT:PRO
Czero(21)
 2230 BPUT#D%,2:BPUT#D%,&1B:BPUT#D%,&34:
PROCzero(12)
 2240 BPUT#D%,2:BPUT#D%,&1B:BPUT#D%,&35:
PROCzero(12)
 2250 BPUT#D%,3:BPUT#D%,&1B:BPUT#D%,&2D:
BPUT#D%,1:PROCzero(11)
 2260 BPUT#D%,3:BPUT#D%,&1B:BPUT#D%,&2D:
PROCzero(42)
 2270 BPUT#D%,2:BPUT#D%,&1B:BPUT#D%,&45:
PROCzero(12)
 2280 BPUT#D%,2:BPUT#D%,&1B:BPUT#D%,&46:
PROCzero(12)
 2290 BPUT#D%,1:BPUT#D%,&23
 2300 PROCzero(14):PROCdata(12)
 2310 BPUT#D%,((hp%+1) DIV ls%)
 2320 BPUT#D%,(ts% DIV ls%)
 2330 BPUT#D%,(bs% DIV ls%)
 2340 BPUT#D%,((pl%-bs%+fp%-1) DIV ls%)
 2350 BPUT#D%,(pl% DIV ls%):BPUT#D%,1
 2360 BPUT#D%,ls%:BPUT#D%,10
 2370 PROCzero(37):PROCdata(7):PROCzero(
56)
 2380 BPUT#D%,&EC:BPUT#D%,&FF:BPUT#D%,2
 2390 PROCzero(253):PROCdata(55)
 2400 ENDPROC
```

➤

Get it right ✓

```
  10 =    0 0
  20 =    0 0
  30 =    0 0
  40 = E76A A
  50 = 654A F
  60 = 376E 4
  70 = 8AFC B
  80 = 4137 5
  90 = BC40 F
 100 = 162E 6
 110 = 1695 F
 120 = B1D8 4
 130 = EA62 E
 140 = 29E7 1
 150 = DD8C 3
 160 = 1EC2 2
 170 = 3489 C
 180 = B1D8 5
 190 = D385 6
 200 = 3DF1 6
 210 =  10E 4
 220 = 50D1 8
 230 = 6561 E
 240 = D877 F
 250 = 941C D
 260 = D929 2
 270 = 9671 0
 280 = 9CDB A
 290 = BE70 B
 300 = 64BD 9
 310 = 1502 3
 320 = BFBA E
 330 = 26EE 4
 340 = E3E4 B
 350 = 6792 A
 360 = 27E1 F
 370 = A3CB 8
 380 =  BEA 2
 390 = D2AF D
 400 =  A1E 7
 410 = 3059 3
 420 = D87C A
 430 = 7139 8
 440 = 9DCE 2
 450 = 6534 0
 460 = 2C83 D
 470 = 2F39 E
 480 = F79E 3
 490 = 9719 3
 500 =  378 C
 510 = 4107 3
 520 = 49F9 4
 530 = D797 6
 540 = C148 6
 550 = 9FBA E
 560 = 7B3A 3
 570 = 3C8A 2
 580 = 2817 B
 590 = 10CD E
 600 = 5D86 C
 610 = 2E36 8
 620 = 1DD6 6
 630 = FD2E 7
 640 = 9719 1
 650 = DA7B 6
 660 = 1A08 0
 670 = 60CB 1
 680 = 2053 2
 690 = D933 4
 700 = BFBA 1
 710 = 124B 7
 720 = 3FB2 C
 730 = 684B B
 740 = 199C 7
 750 = A269 5
 760 = BFBA 8
 770 = 6792 0
 780 = EA93 A
 790 = C56A 3
 800 = 89F9 9
 810 = 7CBA B
 820 = 7DA6 0
 830 =  F48 9
 840 = 1828 9
 850 = EDOF F
 860 = 9719 0
 870 = DB35 6
 880 = B7F9 3
 890 = 4E0E D
 900 = 7F79 6
 910 = 2895 7
 920 = DF57 9
 930 = 2214 8
 940 = C233 F
 950 = 2C83 A
 960 =  9EF B
 970 = EDOF C
 980 = 9719 0
 990 =  4B2 9
1000 = 1911 4
1010 =  DF1 3
1020 = A0D8 1
1030 = 3756 8
1040 = 6EB1 2
1050 = 2C83 B
1060 = 92CB 3
1070 = 86DA 8
1080 = EDOF 1
1090 = 9719 F
1100 = C6B1 9
1110 = CCE3 B
1120 = 3A4C E
1130 = EDOF 3
1140 = 9719 6
1150 = 90AE 3
1160 = 8D47 E
1170 = F572 C
1180 = 3BCE E
1190 = 6FC8 7
1200 = C167 4
1210 = 68E2 6
1220 = 1D5C 0
1230 = 579C B
1240 = 6660 1
1250 = EDA1 6
1260 = F7A6 D
1270 = C133 B
1280 = 332C 9
1290 = 25FA 9
1300 = D4A2 3
1310 = 8AF2 B
1320 = 31E0 2
1330 = 481A F
1340 = 4735 F
1350 = 50BB 6
1360 = 2F73 0
1370 = 71C9 5
1380 = B913 9
1390 = 5370 5
1400 = E687 3
1410 =  35B 7
1420 = 3332 A
1430 = 5EE1 8
1440 = D895 E
1450 = 3FD9 A
1460 = 16CB B
1470 = 9719 3
1480 =  4D9 D
1490 = A194 A
1500 = 7908 4
1510 = 1567 B
1520 = 7FC2 2
1530 = 2C83 6
1540 = 1377 E
1550 = EDOF 1
1560 = 9719 B
1570 = D928 4
1580 = 7BB8 9
1590 = D541 7
1600 = 6D00 0
1610 = 9598 E
1620 = 2BAE 9
1630 = 316C A
1640 = 49CB 7
1650 = 6929 8
1660 =  A73 3
1670 = 92CB 1
1680 = EDOF B
1690 = 9719 B
1700 = 2258 B
1710 = A194 9
1720 = 3D16 8
1730 = 82DE D
1740 = FC83 D
1750 =  A04 9
1760 = 20D8 A
1770 = F01C 8
1780 = EDOF 1
1790 = 9719 A
1800 = 8C2F A
1810 = 7D59 0
1820 = 3F4C 3
1830 = E4E8 3
1840 = 293F 7
1850 = EDOF B
1860 = D0F0 0
1870 = 5DCC D
1880 = 859B 1
1890 = EDOF 8
1900 = 9719 9
1910 = 7739 8
1920 = 9813 E
1930 = A5EF 2
1940 = 90F1 B
1950 = 2C83 F
1960 = 64BD 5
1970 = EDOF E
1980 = 9719 C
1990 = FAE1 7
2000 = BFBA C
2010 = 3A1E 5
2020 = F79E 5
2030 = F814 A
2040 = A785 1
2050 = 9CFB E
2060 = CCFB 1
2070 = 952F 0
2080 = DEB6 9
2090 = 5EA6 D
2100 = EDE2 4
2110 = AD71 1
2120 = B015 0
2130 = 8F73 B
2140 = D1DF C
2150 = 4F18 4
2160 = D829 6
2170 = B3F9 4
2180 = 2D99 4
2190 = 3477 C
2200 = 2D50 4
2210 = 173E 3
2220 = E969 7
2230 = B2B7 8
2240 = 6AFE A
2250 = 5D80 9
2260 = 1146 9
2270 = 62B5 B
2280 = 1A4F D
2290 =  C98 0
2300 = 8C46 C
2310 = 3A2B A
2320 = D1DF D
2330 = 36F6 B
2340 = D239 1
2350 = 8692 4
2360 = 6558 E
2370 = 6586 8
2380 = 5812 2
2390 = CB56 2
2400 = EDOF 9
2410 = 9719 D
2420 = 80AF 2
2430 = 6A6F 8
2440 = EDOF 7
2450 = 9719 F
2460 =  361 E
2470 = E9CA 4
2480 = EDOF A
2490 = 9719 7
2500 = 69A8 9
2510 = BD12 8
2520 = 4F63 B
2530 = 8470 E
2540 = C725 8
2550 =  C36 F
2560 = D16F 2
2570 = 2557 6
2580 = EDOF 6
2590 = 9719 A
2600 = 4F29 8
2610 = FE85 7
2620 = 1BBE 1
2630 = E875 0
2640 = 9AB4 8
2650 = E550 E
2660 = 8DA2 3
2670 = A439 D
2680 = 6B7D 0
2690 = 9C9D 2
2700 = FE69 F
2710 = 80C1 8
2720 = 9D07 F
2730 = CBD9 0
2740 =  F22 6
2750 = EAA7 4
2760 = 5E9E 6
2770 = EC79 C
2780 = 13D0 A
2790 = 227C 8
2800 = 6A98 8
2810 = E3D7 3
2820 = 4AA1 6
2830 = D4A2 A
2840 = EDOF 2
2850 = 9719 4
2860 = 2FF5 3
2870 = 7536 9
2880 = BDA2 9
2890 = B64D A
2900 = 1F1D 5
2910 = 9B9C 1
2920 = 5C13 B
2930 = 5392 1
2940 = 9514 7
```

➤

```
 2410 :
 2420 DEFPROCzero(num%)
 2430 FOR I%=1 TO num%:BPUT#D%,0:NEXT
 2440 ENDPROC
 2450 :
 2460 DEFPROCdata(num%)
 2470 FOR I%=1 TO num%:READ A%:BPUT#D%,A
%:NEXT
 2480 ENDPROC
 2490 :
 2500 DEFPROCcheck
 2510 IF code$="TS" AND ts%<0 THEN ts%=V
AL(par$):ENDPROC
 2520 IF code$="BS" AND bs%<0 THEN bs%=V
AL(par$):ENDPROC
 2530 IF code$="HP" AND hp%<0 THEN hp%=V
AL(par$):ENDPROC
 2540 IF code$="FP" AND fp%<0 THEN fp%=V
AL(par$):ENDPROC
 2550 IF code$="LS" AND ls%<0 THEN ls%=V
AL(par$):ENDPROC
 2560 IF code$="PL" AND pl%<0 THEN pl%=V
AL(par$):ENDPROC
 2570 IF code$="EP" THEN pb%=16
 2580 ENDPROC
 2590 :
 2600 DEFPROCiembed
 2610 IF code$="DE" THEN BPUT#D%,19:ENDP
ROC
 2620 IF code$="UE" THEN BPUT#D%,20:ENDP
ROC
 2630 IF opt$="2" THEN GOTO 2660
 2640 IF code$="DS" THEN BPUT#D%,11:ENDP
ROC
 2650 IF code$="US" THEN BPUT#D%,12:ENDP
ROC ELSE GOTO 2720
 2660 IF code$<>"DS" THEN GOTO 2680
 2670 IF VAL(par$)=0 THEN BPUT#D%,19:END
PROC ELSE BPUT#D%,11:ENDPROC
 2680 IF code$<>"UL" THEN GOTO 2700
 2690 IF VAL(par$)=0 THEN BPUT#D%,20:END
PROC ELSE BPUT#D%,12:ENDPROC
 2700 IF code$<>"IT" THEN GOTO 2720
 2710 IF VAL(par$)=0 THEN BPUT#D%,21:END
PROC ELSE BPUT#D%,14:ENDPROC
 2720 IF code$="CE" THEN BPUT#D%,16:ce%=
1:ENDPROC
 2730 IF code$=JO$ THEN BPUT#D%,18:ENDPR
OC
 2740 IF code$=NJ$ THEN BPUT#D%,25:ENDPR
OC
 2750 IF code$="PP" THEN BPUT#D%,3:ENDPR
OC
 2760 IF code$="BP" THEN BPUT#D%,1:BPUT#
D%,0:BPUT#D%,&87:ENDPROC
 2770 IF code$="CP" THEN BPUT#D%,2:BPUT#
D%,0:BPUT#D%,(VAL(par$)-1):BPUT#D%,&87:E
NDPROC
 2780 IF code$="LL" THEN rm%=VAL(par$):P
ROCiruler:ENDPROC
 2790 IF code$="LM" THEN lm%=VAL(par$):P
ROCiruler:ENDPROC
 2800 IF code$="IN" THEN in%=VAL(par$):P
ROCiruler:ENDPROC
 2810 IF code$="DT" THEN PROCiruler
 2820 IF code$="TI" THEN BPUT#D%,13:FOR
I%=1 TO VAL(par$):BPUT#D%,32:NEXT:G%=in%
+VAL(par$):ENDPROC
 2830 IF code$="SP" THEN FOR I%=0 TO VAL
(par$):BPUT#D%,13:NEXT:G%=in%:ENDPROC
 2840 ENDPROC
 2850 :
 2860 DATA "C","h","a","z","J","e","z","
J","i","m","I","a","n"
 2870 DATA 2,0,0,&19,0,1,0,2,0,2,0,3,&25
,3,0,0,&26,3,&37,3,0,0,0,0
 2880 DATA 14,32,80,4,12,64
 2890 DATA 0,7,0,&19,4,50,&C0,0,80,0,&55
,0,&21,&22,0,0,2,4,0,&21,&22,1,0,2,4,0,&
21,&22,1,0
 2900 DATA 1,0,0,1,1,&7C,0,1,255,0,0,0
 2910 DATA 1,0,33,34,1,0,&A1
 2920 DATA &22,&12,0,&85,&86,4,&4A,4,&40
,0,&87,80,65,71,69,32,3,255,255,&85,&86
 2930 DATA 0,74,0,0,0,7,15,23,31,39,47,5
5,63,71,&87,255,255,&85,&86
 2940 DATA 0,69,0,0,0,72,74,76,78,80,82,
84,86,88,&87
```

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VISA Access

Of micros and Medusa

The lighthearted saga of two micro addicts continues

Dear Trev

I must stop going to the Ram and Buffer, it's doing me no good at all; I always end up doing something daft. For example: I proposed to Andrea after several pints of Boddard's Best. At least she says I did, I can't remember. That hangover's lasted a lifetime.

It's not even as though I fit in any more. The new members are getting younger and I'm not. Only the other day I heard someone refer to me as a "boring old hacker". At least that's what I think they said.

Sometimes I feel like the Inspector Cleauseau of micro world. "Does your Beah Beah Ceah have bates?"

Anyway, there I was at the Romchester Rogue's monthly quiz night. This isn't as intellectual a pursuit as you might imagine. Not that you could imagine anything like it anyway.

It's a sort of cross between Dante's Inferno and Mastermind with overtones of Prime Minister's Questions, and Andrea asking just how much I'd had the night before. ("Before what?"). The quiz only ever has one question and the best (worst) answer gets a prize from the sponsors, Acron.

This month the question was "Why did you get a micro in the first place?" which really stumped most of us. "Because it was fashionable" wasn't accepted as an answer, even though I suspect it was true. Remember those glorious days when you couldn't open a paper without seeing a picture of computer whizz kids? They're probably whizz adolescents now with high resolution pixels instead of spots.

Anyhow, the prize for winning the quiz was a Model A expansion kit. Acron know no bounds in their generosity – last month it was a teletext adaptor. Again. Still that was better than Nut Abuser's offering: 1001 Things To Do With A User Port, a sort of Karma Sutra of the Beeb. We soon thought of a thousand and twoth.

So there I was, sat sitting in the pub's upstairs room, supping my pint and desperately wishing that Doreen would get off her ecology kick and stop referring to me as her "lead-free Bob" and quit telling people that "I won't know what to do when he passes his Mode 7" and thinking that I wasn't ever going to write a sentence as long as this again when I was engaged in conversation by Bill.

I say Bill, but among the rogues he's know as William the Wimp. Not because of his personal characteristics – though if you carry a pink filofax and drink halves of lager shandy with your left hand, you get what you deserve in my opinion – but because of what he does. Which is research in Romchester University's Computer Department.

Doreen's always hated him since he tried to join the local feminist group and took them to the Sexual Relations Board (or whatever it's called) for discrimination.

"Hello, Bob" he said, braving Doreen's Medusa imitation, "I wonder if you could help me with my research into HCI".

"Have you had too much to drink?" D. queried. "I didn't think it was strong enough".

"I said 'HCI' not 'HIC'", came the reply.

"Isn't that hydrochloric whatsit?" asked Doreen, acidly.

"No, HCI – Human Computer Interaction",

"How can Bob help? He's not a computer! And he's hardly human. Anyway, what is it?"

She shouldn't have asked because Bill went into his I'm-going-to-be-a-lecturer-when-I-grow-up mode. Not a pretty sight.

"Well HCI, or CHI as the american's call it, though I think that's a bit chichi" – here he paused waiting for us to laugh, waited a bit longer and then gave up – " is the study of the way that humans use computers, the man-machine interface".

"Aren't there laws about that?" Doreen asked innocently. "Something to do with wellies, I'm sure".

"No, what I mean is that man's a tool-using animal", he paused sheepishly while Doreen muttered something nasty about me, "and the computer is just another tool. I'm looking at ways of using tools," – another burst of what I suspect was stifled laughter from Doreen – "and I'm told that Bob can help me."

At this point Doreen collapsed completely and rushed over to another table where I heard her talking about "Bob's micro tool".

I remember thinking of 2001 for some reason, picturing the ape throwing his tool into the air. If that bone had landed in the wrong place evolution might have turned out very differently. And there'd have been no HAL computer to interface with in a verbal, Hal-fellow-well-met kind of HCI.

"How can I help?" I asked desperately.

"Well Clive" – I might have known it – "told me that you were into OSCLIs and I'm doing research into GUIs in general and Wimps in particular".

At this point D. was just about to rejoin us but on hearing the end of what Bill was saying she rushed off again and started talking to Clive about "peculiar wimps" in a very loud voice.

I'd better explain that Bill suffers from SAD – Superfluous Acronym Disorder. Well, I knew what Wimps are – windows, icons, menus and pointers – but what was a GUI when it was at home? And what kind of home did it live in? Sadly Bill didn't leave me in my blissful ignorance for long.

"A GUI", he continued – ignoring Doreen's cries of 'Guiii, I'm here' – "is a Graphical User Interface, whereas an OSCLI is an Operating System Command Line Interpreter. You use OSCLIs all the time with your BBC so you'll be ideal to test a new wimp on. Will you volunteer?"

"Yes he will," agreed Doreen.

Which was how I ended up at the university's micro lab up to my neck in GUIs. I'll give you a graphic acount next time.
Cheers,

Bob

PS: At last I've been able to write a letter without mentioning Mike Cook.

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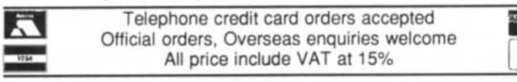

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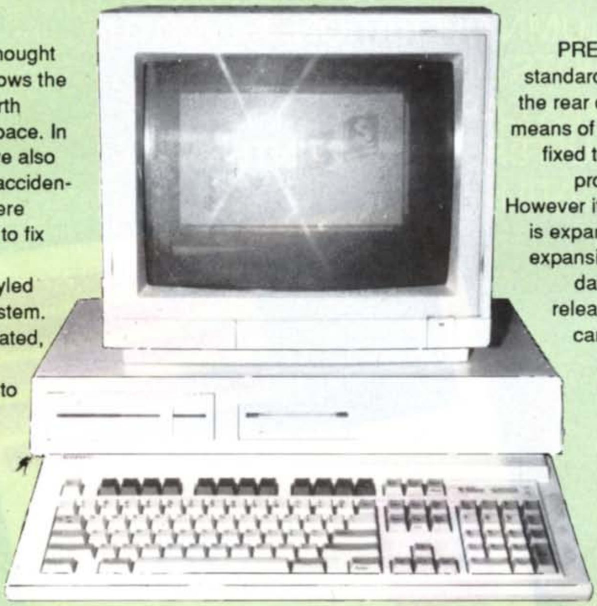
A3K1 is expandable to A3K2, a styled housing to take the **A3000** to a system. A3K2 is supplied with a post regulated, switch mode power supply and provides the means for adding up to 2 additional floppy drives (2 x 3.5" or 1 x 3.5" + 1 x 5.25") and a Winchester hard disc drive. All these can be added without having separate boxes hanging from the computer on ribbon cables.



PRES have also allowed for adding standard expansion cards (podules) on the rear of the machine. This is done by means of a casing which attaches and is fixed to the **A3000** case providing full protection for the expansion card. However it does not stop there. The case is expandable to take a backplane and expansion board which can accommodate FOUR mini cards. PRES will release the specification for the mini cards to any third party wishing to have their products on **A3000**. PRES are currently working on a range of Mini Cards, plans include . . . high spec analogue to digital converter, user ROM and battery backed RAM, SCSI, MIDI, 2nd. vdu.

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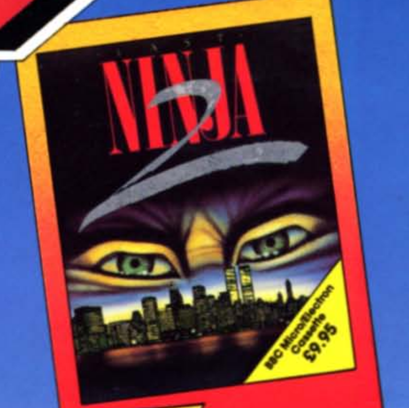
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